Cultural, Social and Technical Mathematics

Secondary IV

STUDY GUIDE

Teacher Development Team:

Annick Gaillard	Riverside School Board
Saadia Ashraf	Lester B. Pearson School Board
Rick Tomalty	Lester B. Pearson School Board
Daniel Maag	Lester B. Pearson School Board
Carmela Nassif	Sir Wilfrid Laurier School Board
Paul Masson	Sir Wilfrid Laurier School Board
Teresa Groenewegen-Caza	New Frontiers School Board
Rafi Khan	Western Quebec School Board

School Board Consultants:

Sandra Frechette (project coordinator)	Riverside School Board
Franca Redivo	Lester B. Pearson School Board
Peter Clark	Sir Wilfrid Laurier School Board
Richard Drapeau	New Frontiers School Board

Document Formatting:

Heather Hopkins	Riverside School Board

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PREPARING FOR THE EXAM AND EXAM TAKING STRATEGIES

Preparing for the Exam

Preparation is key!

- Pay attention to hints your teacher gives you and take notes.
- Pay regular attention in class and ask for help when needed.
- Go to the tutorial sessions (review).
- Do not leave a topic misunderstood hoping it will not be on the exam. It will very likely be on the exam.
- Budget your time, schedule time to study so that you are well prepared for the test (weeks in advance). Do not wait until the day before!
- Create your own clear and well organized memory aid. This requires planning and time.
- Practice with questions from previous MELS Uniform Exams.
- Complete this booklet.
- Have a good night sleep the night before the exam. Go to bed earlier.
- Have a good breakfast. A healthy meal will give you the mental energy you will need to get through it.

The Day of the Exam

You will need to bring:

- at least two HB pencils and a good eraser
- a calculator (with or without graphic display) but make sure all data and programs are deleted
- a ruler
- your memory aid
- a watch to better pace yourself

Optional:

- a set square, a compass and a protractor
- additional graph paper

Exam Taking Strategies

- Keep a positive attitude and try to stay relaxed.
- When you first receive your test, do a quick read of the entire test in order to appropriately pace yourself. Look for what is easy and what will require more effort.
- Do the easiest problems first.
- Don't stay on a problem you are stuck on. Come back to it later.
- Read the entire question at least TWICE.
- Watch out for questions with expressions such as: NOT, STRONGEST TO WEAKEST, INCREASING, DECREASING, etc.
- Ask for clarifications, if needed.
- Write legibly and show all your work when required.
- Look over your test (review). Make sure you've answered everything.
- Do not leave any blanks.

PREPARING A MEMORY AID

A memory aid consists of one letter size (8 ½'' x 11") sheet of paper IN <u>YOUR</u> HANDWRITING. BOTH sides may be used.

It should contain important information required for the exam. It should be NEAT and ORGANIZED. Have a plan and then write the elements on the sheet of paper. You might have to make more than one memory aid before being satisfied with the results. It's worth the time and effort.

Make sure to make your OWN memory aid. It is a good way to study for the exam and you will know where to find the items. You may not use someone else's memory aid (it is considered cheating). And besides, copying someone else's memory aid may not help you at all.

What can it contain?

- Formulas
- Example problems worked out
- The steps used in the problem listed in order
- Reminders of things to look out for in doing a problem
- Any rules used to solve problems
- Definitions
- Tips and hints

How can you organize it?

- The information should be organized by topic (e.g. triangles: congruent, similar…).
- Use lines (or boxes) to separate the different topics (e.g. a section for analytic geometry where you would include distance between two points, midpoint, slope, etc.).
- Use the resources your teacher suggests
- Make sure you include items you tend to forget.
- Use a color code system or a numbering system.

FORMAT OF THE UNIFORM EXAM

The exam will consist of 3 parts:

  A. Multiple Choice Questions (6 questions; 4 marks each)

  B. Short Answer Questions (4 questions; 4 marks each)

  C. Application Questions (6 questions; 10 marks each)

Part A. Multiple Choice Questions

You will read the questions from a Question Booklet and will choose a statement (A, B, C or D) that best represents your answer. You will answer on a machine-scored answer sheet by filling in a circle using an HB pencil. Make sure you fill it in completely.

In this section, you do not need to show work for marks. Always work out the problem entirely and check all the distractors. Do not stop reading when you think you found the right answer. Read everything. You will be given 4 marks or 0 for each question.

Do not leave a blank! Make a choice even if you don't know the answer! You have a 25% probability of getting it right.

Part B. Short Answer Questions

You will read the questions from a Question Booklet and will write a statement in the space provided in your Student Booklet.

In this section, you do not need to show work for marks. However, always work out the problem entirely anyways. You will be given 4 marks or 0 for each question. No part marks are given.

Do not leave a blank! Make an educated guess even if you don't know the answer!

Part C. Application Questions

You will read the questions from your Student Booklet and answer it in the Student Booklet (same booklet).

For each question, you must show all your work to justify your answer.
Your work must be organized and clearly presented and cannot simply involve listing the calculator applications used to obtain results or information.

You will be given a mark of 0 if you do not show work or if your work does not justify your answer (even if you have the correct answer).

You will be graded using the evaluation criteria for competency 2:
  Cr.1   Formulation of a conjecture suited to the situation, <u>if applicable</u>
  Cr.2   Correct use of appropriate mathematical concepts and processes
  Cr.3   Proper implementation of mathematical reasoning suited to the situation
  Cr.4   Proper organization of the steps in an appropriate procedure
  Cr.5   Correct justification of the steps in an appropriate procedure

The scoring will go as follows. The table on the right is for a conjecture situation. Most problems on the exam are scored according to the table on the left.

	Observable indicators corresponding to level					
	A	B	C	D	E	
Cr. 3	40	32	24	16	8	0
Cr. 2	40	32	24	16	8	0
Cr. 4 / Cr. 5	20	16	12	8	4	0

	Observable indicators corresponding to level					
	A	B	C	D	E	
Cr. 3	40	32	24	16	8	0
Cr. 2	20	16	12	8	4	0
Cr. 4 / Cr. 5	20	16	12	8	4	0
Cr.1	20	16	12	8	4	0

As you can see, you can easily obtain marks for showing some work. Write down your process first (the steps) and then show all your work. At the very least, list the concepts you think apply, write out the applicable formulas, etc. Try something!

Do not leave a blank!

SKILL LIST

**Can you do the following?**

Put a check ✓ in the appropriate box

Skill	Yes	Not yet
How to find the **DISTANCE** between two points		
How to find the **MIDPOINT** between two points		
How to find the point that divides a line into a given **RATIO**		
How to find the **slope** of a line		
How to express an equation in both **STANDARD AND GENERAL FORM**		
How to find the **equation of a line given the slope and a point on the line**		
How to find the **equation of a line given two points on the line**		
How to find the **equation of a line parallel to a given line**		
How to find the **equation of a line perpendicular to a given line**		
How to determine the **number of solutions in a system** (parallel, coincident…)		
How to translate a story into a **SYSTEM OF RELATIONS**		
How to solve a system of equations using the **COMPARISON METHOD**		
How to **display a system of relations and their solution on a graph**		
How to solve a system of equations using the **ELIMINATION METHOD**		
How to solve a system of equations using the **SUBSTITUTION METHOD**		
How to **recognize and translate an INEQUALITY**		
How to solve an **INEQUALITY graphically** and check for feasible region		
How to determine and interpret the following properties in functions:		
• What is a function		
• The domain and range of a function		
• Where the function is increasing, constant and decreasing		
• The minimum and maximum		
• The sign of a function		
• The y-intercept of a function		
• The zeros of a function (x-intercepts)		
How to work with the following functions (words, graph, equation, table):		
• Zero degree		
• First degree (direct)		
• First degree (partial- positive and negative slopes)		
• 2nd degree (quadratic) function $f(x) = ax^2$		
• Exponential function (growth and decay) $f(x) = ac^x$		
• Step function		
• Periodic function		
• Piecewise function		

How to find an **angle** measure using **TRIGONOMETRIC RATIOS (SIN, COS, TAN)**		
How to find a **side** measure using **TRIGONOMETRIC RATIOS (SIN, COS, TAN)**		
How to find an **angle or side** measure using **SINE LAW**		
How to find the **AREA OF A TRIANGLE**- all three methods: • General formula • Hero's formula • Trigonometric formula		
How to apply **CLASSIFICATION OF TRIANGLES**		
How to use **PYTHAGOREAN THEOREM**		
How to explain the differences in the **properties of QUADRILATERALS**		
How to **find the areas of triangles/quadrilaterals/regular polygons**		
How to determine the **angle relationships when parallel lines** are involved		
How to use **algebra and angle relationships to solve for an unknown (x)**		
How to **prove that two triangles are congruent (SSS, SAS and ASA)**		
How to **prove that two triangles are similar (SSS, SAS and AA)**		
How to find the **unknown side lengths in similar figures**		
How to find side lengths using **METRIC RELATIONS**		
How to read a **FREQUENCY TABLE**		
How to make and read a **STEM AND LEAF PLOT**		
How to calculate **MEAN DEVIATION** (and what it tells you about the data)		
How to calculate **PERCENTILE RANK** (and what it means)		
How to **find a score of place GIVEN PERCENTILE RANK**		
How to read a **CONTINGENCY TABLE**		
How to make and **interpret a SCATTER PLOT**		
How to estimate the **CORRELATION COEFFICIENT** (and what it means)		
How to determine the **STRENGTH AND DIRECTION** of the **CORRELATION COEFFICIENT**		
How to determine and represent the **EQUATION OF A REGRESSION LINE** (e.g. Median-Median method, Meyer line method, best fit method)		
How to **draw a curve** associated with the chosen model		
How to **interpolate or extrapolate values using a REGRESSION LINE**		
How to determine the **PROBABILITY OF A SINGLE EVENT**		
How to determine the **PROBABILITY WITH WEIGHTED OUTCOMES**		
How to switch back and forth between **PROBABILITY AND ODDS**		
How to determine **ODDS FOR or ODDS AGAINST**		
How to **CALCULATE MATHEMATICAL EXPECTATION IN GAMES OF CHANCE**		
How to **MAKE A GAME FAIR** using Mathematical expectation		
How to recognize and associate the **type of probability** to a situation: **EXPERIMENTAL, THEORETICAL and SUBJECTIVE**		

1.1 Points and Segments in the Cartesian Plane

Question:

What is the rate of change for line segment AB?
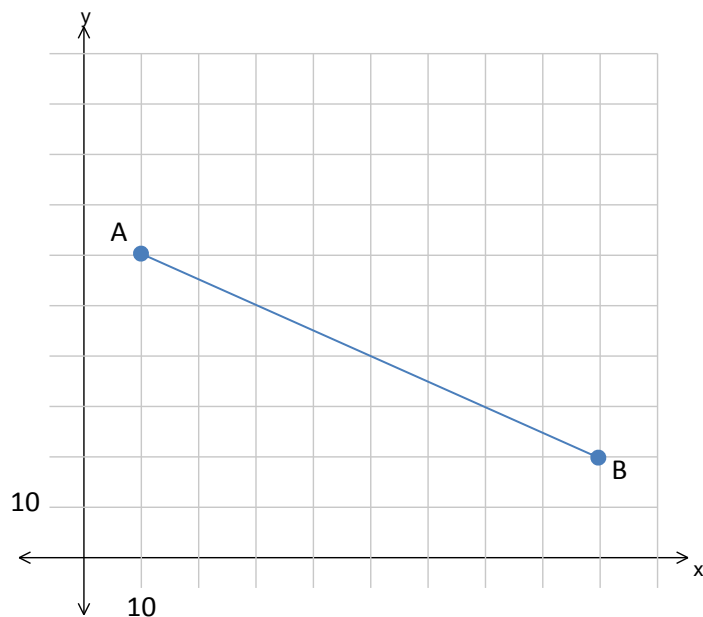
A) -2

B) $-\dfrac{1}{2}$

C) $\dfrac{1}{2}$

D) 2

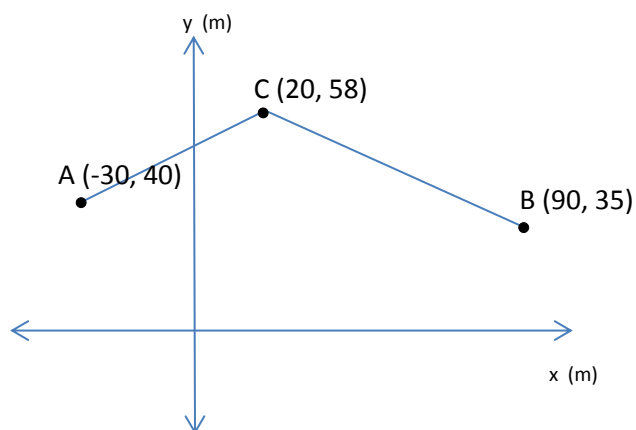**General Strategies:**

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

What is the endpoint of a line segment which has one end at (6, 18) and the midpoint at (18, 30)?

A)   (−6, 6)

B)   (12, 24)

C)   (24, 12)

D)   (30, 42)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Point P is located $\frac{3}{5}$ of the distance from point B (25, 75) and point A (10, 30).

Which coordinates represent point P?

A)   (15.625, 46.875)

B)   (16, 48)

C)   (19, 57)

D)   (19.375, 58.125)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

On a coordinate plane, Jim's house is situated on a line that runs from his school to the swimming pool.

The school is at point A (200, 800) and the pool is at point B (1200, 1600).

Jim's house divides line segment AB into a ratio of 4:1 from point A.

What are the coordinates of Jim's house?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Jim's house is situated at (,   ).

Question:

How much longer is $\overline{BC}$ than $\overline{AC}$?

y (m)

C (20, 58)

A (-30, 40)

B (90, 35)

x (m)

$\overline{BC}$ is _____m longer than $\overline{AC}$.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.

Do not leave a blank!

My Strategies:

Question:

Bill says that his house is exactly the same distance to the water tower as Alan's house is.

Alan does not believe him so he makes a Cartesian plane and puts all the information that he knows is true on the graph.

He starts by making Birch St. the x-axis and Maple Ave. the y-axis since they are perpendicular to each other.

He knows his house is in a straight line with Bill's and the school is midway on the line between their houses.

He also knows that the water tower is on Maple Ave. 1100 m from Birch St.

Finally he puts the co-ordinates of his house (-400, 200) and the co-ordinates of the school (200, 400) on the graph.

Which of the boys is correct?
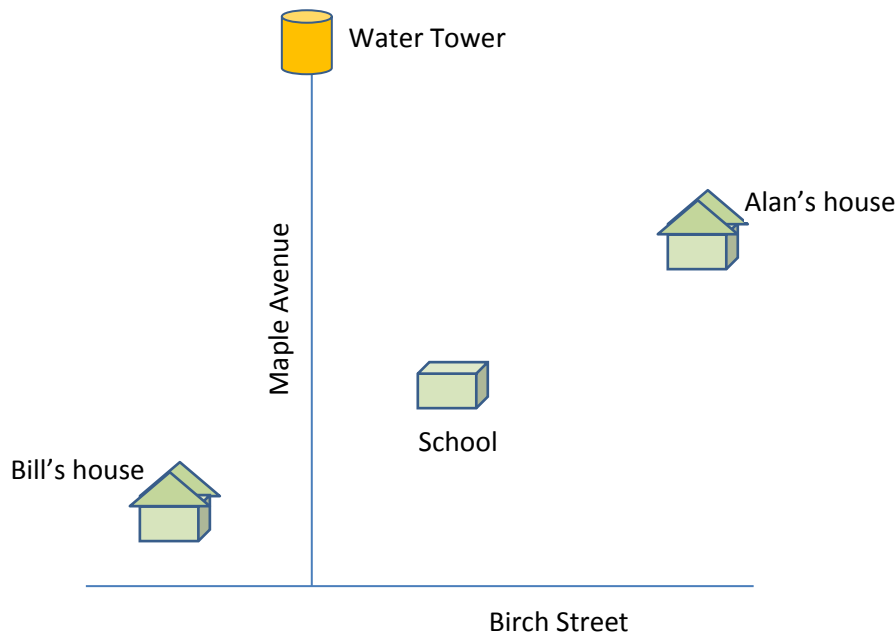
General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

1.2 Lines in the Cartesian Plane

Question:

What is the rule for the linear function that corresponds to the table below?

x	−10.2	−6.4	3.4	12.8
y	53.7	40.4	6.1	−26.8

A) $-7x - 2y - 36 = 0$

B) $7x - 2y + 36 = 0$

C) $-7x + 2y - 36 = 0$

D) $7x + 2y - 36 = 0$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

1.2-MC-B

Question:

Which of the following equations represents a line perpendicular to $4x + 3y + 12 = 0$?

A) $3x + 4y - 8 = 0$

B) $y = \frac{4}{3}x - 4$

C) $-3x + 4y - 8 = 0$

D) $y = -\frac{4}{3}x + 4$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

What is the *x*-intercept for the following linear equation:

$$2x + 3y + -6 = 0$$

A)   −3

B)   −2

C)   2

D)   3

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank! Make a choice!

My Strategies:

Question:

Which rule represents the line parallel to
$3x - 4y - 24 = 0$ that passes through point P(-8, 7)?

A) $-3x + 4y - 13 = 0$

B) $-3x + 4y - 52 = 0$

C) $y = \dfrac{3x}{4} + 52$

D) $3y = -4x - 13$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Line L has equation $-4x + 5y - 10 = 0$.

What is the *x*-intercept of the line perpendicular to L that passes through point P (12, 15)?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The *x*-intercept of the line perpendicular to L that passes through P is _____

Question:

The slope of line 1 is $\frac{4}{3}$ with a *y*-intercept of -3.

Line 2 is perpendicular to line 1 and passes through point (2, 5).

What is the equation of line 2?

The equation of line 2 is _____

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Given the equation:

$$8x + 6y + 12 = 0$$

A)   What is the x-intercept?
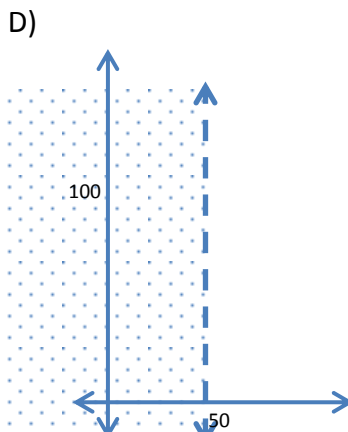
B)   What is the y-intercept?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The x-intercept is _____

The y-intercept is _____

Question:

A car is travelling along a straight path from point A (-24, -39) to point B (30, 33).

The car breaks down, having completed exactly two-thirds of the trip.

A tow truck must travel along a path that is perpendicular to the car's path, leaving from a garage located somewhere along the x-axis.

How far must the tow-truck travel to get from the garage to the car? (All units are in km.)
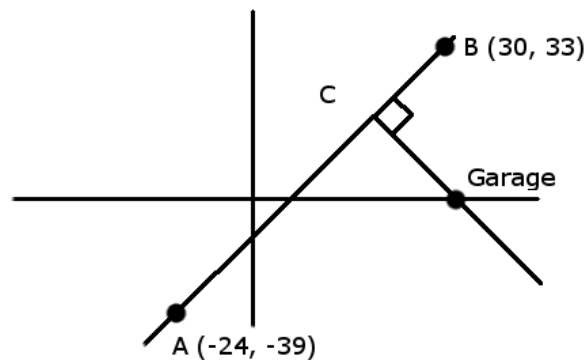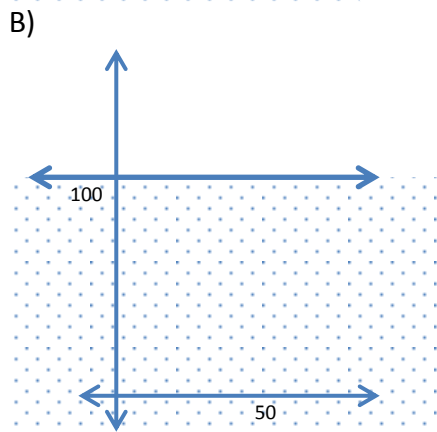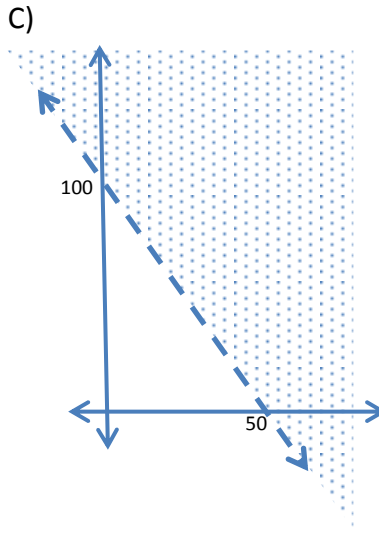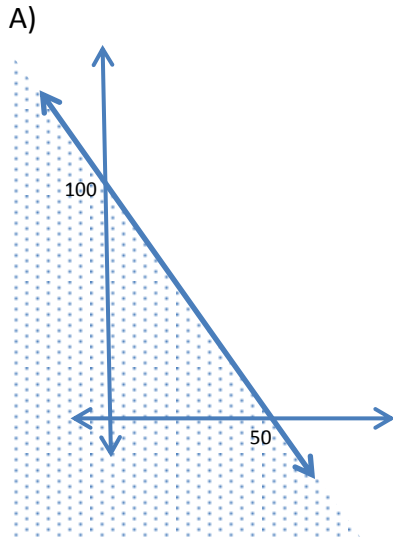

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

1.3 Systems of Equations

Question:

Consider the following system of linear equations.

$$2x + 3y + 6 = 0$$

$$y = \frac{-2x}{3} - 4$$

Which of the following statements is true?

A)   The system has an infinite number of solutions.

B)   The system has a unique solution.

C)   The system has no solution.

D)   The system has two solutions.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Given the following system of equations.

$$2x - 5y + 12 = 0$$

$$x - 3y = 4$$

What is the solution for this system?

A) $(-41, -14)$
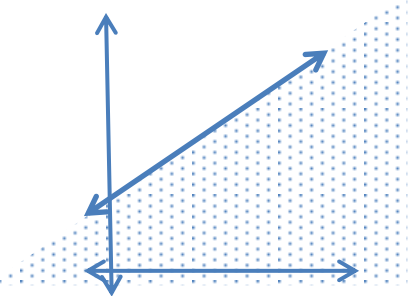
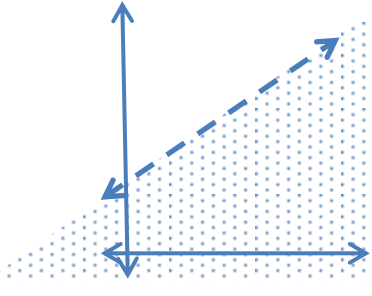B) $(-44, -20)$

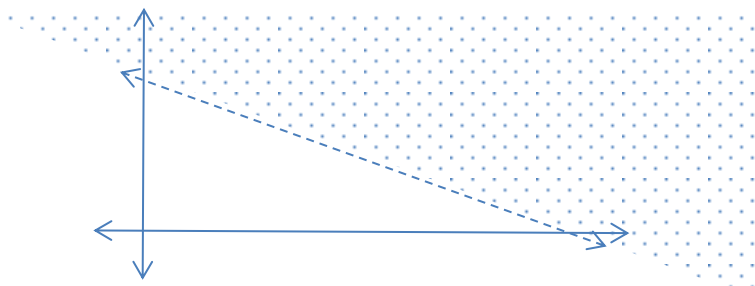C) $(-56, -20)$

D) $(-56, -12)$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Stephane purchased 3 chocolate chip cookies and 4 peanut butter cookies for $5.65. Marie purchased 5 chocolate chip cookies and 7 peanut butter cookies for $9.70.

What is the price of a peanut butter cookie?

A)   70 cents

B)   75 cents

C)   80 cents
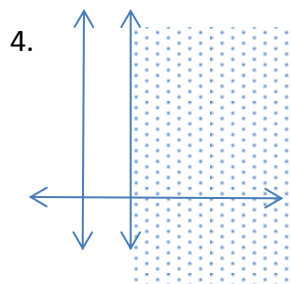
D)   85 cents

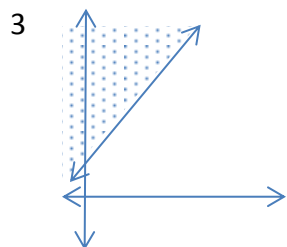**General Strategies:**

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A kitchen cabinetmaker has two models of upper cupboards which a client can choose from to complete a kitchen installation.

Three different clients ordered different combinations of tall and short cabinets. The total cost including delivery is listed below for clients A and B.

Client	Number of Tall Cabinets	Number of Short Cabinets	Delivery Cost	Total Cost
A	7	4	$120	$1840
B	9	8	$190	$2630
C	11	2	$170	?

Client C believes his total cost is lower than client B's.

Is he correct?

☐ Yes

☐ No

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

1.4 Half-Planes in the Cartesian Plane

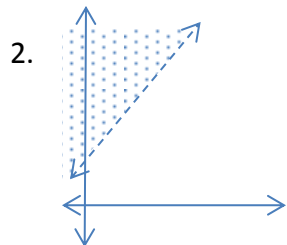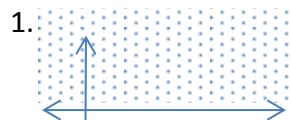## Question:

Which graph below satisfies (100, 200)?

A)

C)

B)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which graph below corresponds to the inequality
$$-12.5x + 25y - 100 < 0 \ ?$$

A)
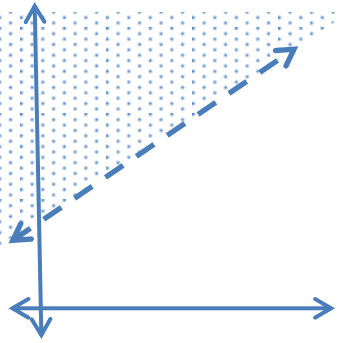
C)
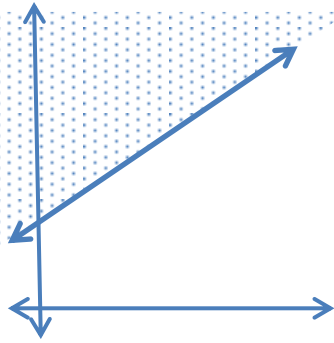
B)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which rule represents the inequality graphed below?

A) $2y \leq 150x + 50$

B) $0 > -3y - x + 75$

C) $y \geq -\frac{1}{3}x + 25$

D) $y > 75x + 25$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the inequality $4x - 2y < 8$ and point P (14, 24).

Is point P a solution to the inequality?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

☐ Yes, P is a solution to the inequality.

☐ No, P is not a solution to the inequality.

Question:

Match the graphs to their corresponding rule:

1.

2.

A	$-3x + y - 5 \geq 0$
B	$-3x - 5 > -y$
C	$y - 5 \geq 0$
D	$0 \geq -x + 5$

3

Answers:

1. _____

2. _____

3. _____

4. _____

4.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer-what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Juanita studies the layout of the IMAX theater by her house. Considering the angle of the seats, the width of the screen and the sound system, she comes up with a theory of where the best seats are.

She represents her theory as three inequalities on a Cartesian plane. The Cartesian plane represents the theater, and each of the intersections (lattice points) represents one seat.

Juanita's inequalities:
$$4x < -3y + 72$$
$$y < \frac{4}{3}x + 6$$
$$y \geq 10$$

The area where all three inequalities overlap contains the best seats.
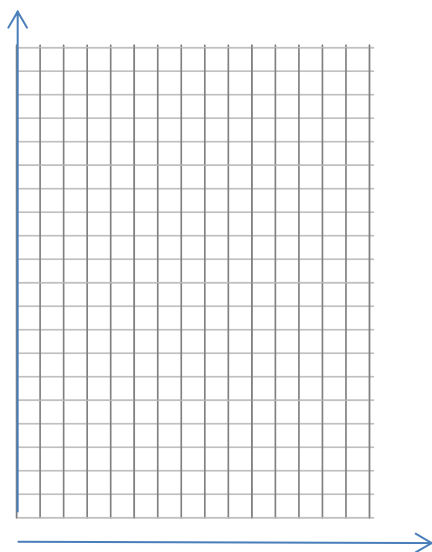
How many of the seats can be considered the "best seats"?

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

2.1 Diagrams and Statistics (Dispersion, Deviation, Stem and Leaf…)

Question:

What is the mean deviation of the following set of data?

21 21 21 23 23 23

A)   0

B)   1

C)   2

D)   6

Question:

Which of the following statements is/are true concerning statistical measures?

 I.   The mean, median, and range are measures of central tendency.

 II.   Percentile rank is a measure of dispersion.

 III.   The mean deviation and range are measures of dispersion.

 IV.   The mean deviation is a measure of position.

A)   I only

B)   III only

C)   II and III only

D)   II and IV only

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the stem-leaf plot below showing the number of sit-ups students do in 60 seconds.

	Number of Sit-ups
2	0 1 1 2 2 8 9
3	2 2 3 4 5 6 6 8 9
4	1 1 2 3 4 4 4 5 6 7 8
5	0 1 1 2 5 6 6 7 8 8 8
6	2 4 6 6

How many sit-ups did a student do if they are ranked in the 70th percentile?

A)   35

B)   36

C)   51

D)   52

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

At a large company, a survey was conducted to see how fast employees can type. The company has 305 employees. The partial list below shows the speed, in words per minute, achieved by the employees:

30, 32, 32, … 49, 50, 50, 50, 52, 53, 53, … 89, 90, 93, 99

146 employees   3 employees   156 employees

What is the percentile rank for an employee who types 50 words per minute?

A)   47

B)   48

C)   49

D)   50

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem without looking at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the following set of data:

41 17 25 9 20 12 11 21 20

What is the mean deviation for the set of data?

My Strategies:

The mean deviation for the set of data is _____.

Question:

The table below shows the finishing times for the 137 runners participating in a 5 km race:

18:48	26:36	29:22	31:34	35:08	38:04	48:58
20:01	26:37	29:29	31:55	35:09	38:45	48:58
21:19	26:43	29:29	32:13	35:09	38:59	49:50
21:55	26:48	29:30	32:26	35:35	39:21	49:51
23:36	26:54	29:30	32:28	35:39	39:22	50:01
23:36	27:20	29:31	32:28	35:45	39:38	53:40
24:15	27:38	29:49	32:36	36:11	40:52	56:19
24:29	27:50	29:56	32:50	36:11	41:07	56:20
24:34	27:50	30:02	32:56	36:12	41:35	57:06
24:34	27:56	30:03	32:57	36:24	41:35	59:12
24:35	28:32	30:08	33:07	36:25	44:44	59:14
25:01	28:42	30:28	33:09	36:25	44:45	59:18
25:04	**28:45**	30:31	33:14	36:27	46:01	1:00:55
25:08	**28:45**	30:31	33:30	37:21	46:15	1:01:05
25:08	28:59	30:34	33:39	37:21	46:22	1:03:39
25:44	29:02	30:39	33:46	37:25	46:24	1:03:42
25:58	29:04	31:07	33:46	37:43	47:05	1:03:46
26:19	29:13	31:25	33:46	37:54	47:19	
26:24	29:17	31:27	34:22	37:58	47:19	
26:31	29:17	31:29	34:43	38:03	48:11	

A)   What is the percentile rank of the runners with a finishing time of 28 minutes 45 seconds?

B)   What is the finishing time of the runner who ranked in the 60th percentile?

The percentile rank of the runner finishing with 28:45 is _____.

The finishing time of the runner ranked in the 60th percentile is _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!
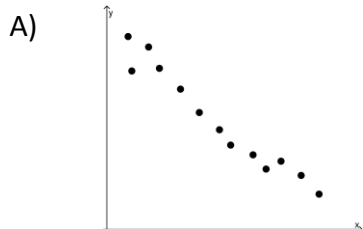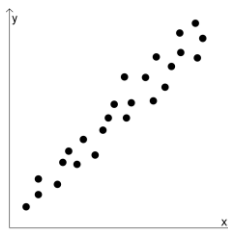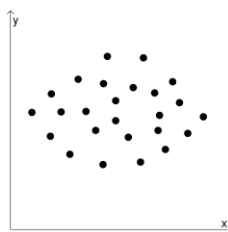
My Strategies:

Question:

The 20 best swimmers from across the country are trying out for the national swim team. To earn a spot on the team, a swimmer must meet both the following qualifications:

Qualification 1
The swimmer must rank better than the 60th percentile.

Qualification 2
The swimmer must have a "personal best time" (PBT) that is less than or equal to 20 seconds *minus* the mean deviation (MD) of the group.

$$PBT \leq 20 - MD$$

"Personal Best Times"
(in seconds)

18.56	19.25	19.92	20.2
18.7	19.26	19.92	20.4
18.9	19.8	19.94	20.8
18.95	19.85	19.96	20.8
19.2	19.9	19.99	21.1

The mean of this distribution is 19.77 seconds.

How many of the 20 swimmers will earn a spot on the National team?

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

2.2 Qualitative Interpretation of Correlation

Question:

Which of the following scatterplots shows the strongest linear correlation?
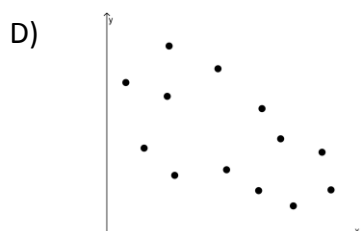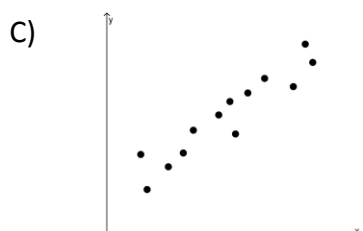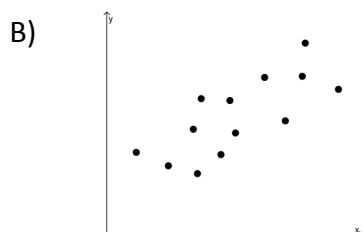
A)

B)

C)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which of the following scatterplots best shows a zero correlation?

A)
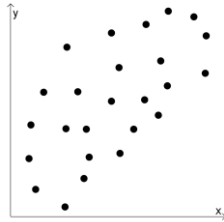
B)
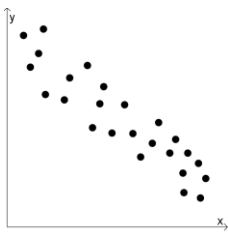
C)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

At a recent school event, students were asked to sit facing the stage. The following table shows the distribution of students according to their ages and the distance from the stage.

DISTANCE (m) AGE (years)	$[2,4[$	$[4,6[$	$[6,8[$	$[8,10[$	$[10,12[$
$[10,11[$	3	3	3	3	3
$[11,12[$	3	3	3	3	3
$[12,13[$	3	3	3	3	3
$[13,14[$	3	3	3	3	3
$[14,15[$	3	3	3	3	3

Which of the following best describes the linear correlation between the age of the students and the distance from each student to the stage?

A)   The correlation is positive.

B)   The correlation is negative.

C)   The correlation is perfect.

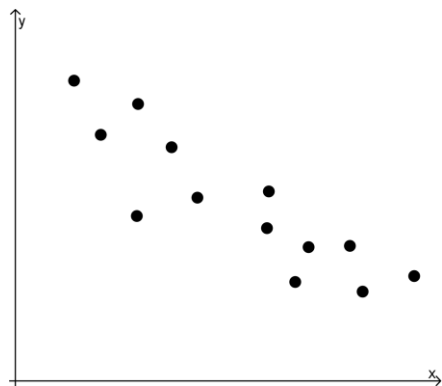D)   The correlation is zero.

General Strategies:

1.   Read the question.
2.   Highlight key words.
3.   Identify the math topic.
4.   Re-read the question.
5.   Refer to your memory aid, as needed.
6.   Look carefully at each choice shown (A, then B, then C and then D).
7.   Eliminate options you know to be incorrect.
8.   Solve/check each possible choice.
9.   Select the choice that makes the most sense.
Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the following table showing a two-variable distribution. Indicate the strength and direction of correlation.

x \ y	[0,1[	[1,2[	[2,3[	[3,4[	[4,5[
1	2	0	0	0	0
2	0	2	0	0	0
3	0	3	2	2	0
4	0	0	0	5	2
5	0	0	0	1	1

Strength   Direction

☐ Weak   ☐ Positive
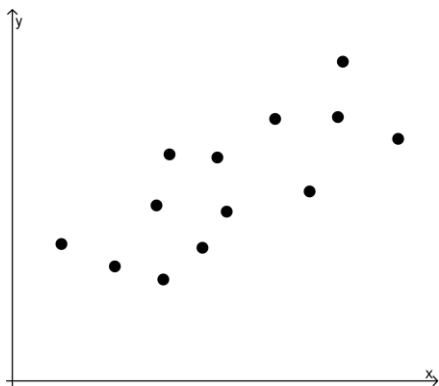
☐ Strong   ☐ Negative

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Consider the following scatterplot.

A)   Is the correlation weak or strong?

B)   Is the direction positive or negative?
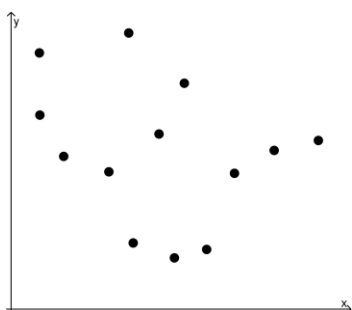
Strength   Direction

☐ Weak   ☐ Positive

☐ Strong   ☐ Negative

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.

Do not leave a blank!

My Strategies:

2.3 Quantitative Interpretation of Correlation

Question:

Consider the following linear correlation coefficients.

$$-0.81 \,,\, 0.39 \,,\, -0.27 \,,\, 0.74$$

Which of the following lists the correlation coefficients from weakest to strongest?

A) $-0.81 \,,\, 0.74 \,,\, 0.39 \,,\, -0.27$

B) $-0.27 \,,\, 0.39 \,,\, 0.74 \,,\, -0.81$

C) $-0.81 \,,\, -0.27 \,,\, 0.39 \,,\, 0.74$

D) $0.74 \,,\, 0.39 \,,\, -0.27 \,,\, -0.81$

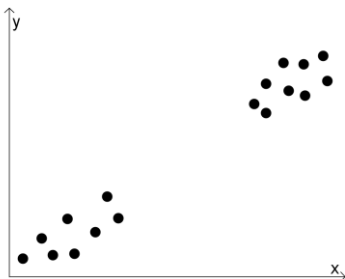## General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which of the following correlation coefficient shows the weakest correlation?

A)   −0.75

B)   −0.45

C)   0.16

D)   0.83

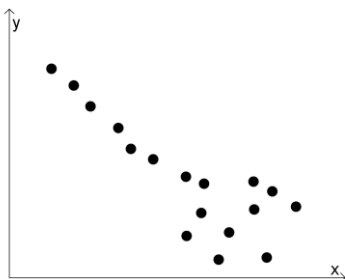## General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
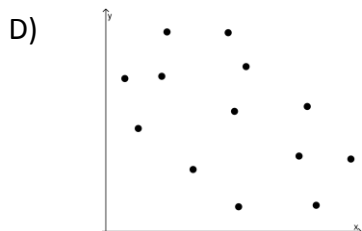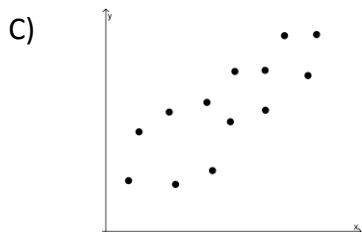9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which of the following correlation coefficients shows a perfect correlation?

A)   −1.00

B)   −0.10

C)   0.00

D)   0.99

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
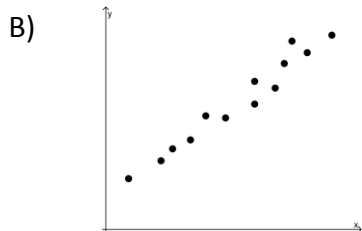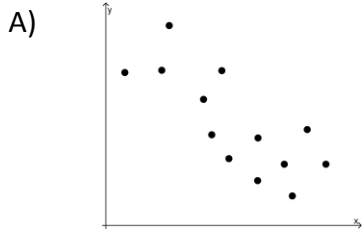9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the following scatterplot.

What is the linear correlation coefficient?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.

Do not leave a blank!

My Strategies:

The linear correlation coefficient is _____.

Question:

Consider the following scatterplot.

Estimate the linear correlation coefficient.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The linear correlation coefficient is _____.

Question:

The Granby Zoo feeds its elephants daily. The chart below shows the weight of several elephants and the weight of the food they are given every day.

Weight of elephant (kg)	Weight of food (kg)
1250	58
1300	63
1320	66
1382	69
1400	67
1460	63
1480	70
1492	76

How much food would an elephant weighing 1600 kg be given? Round your answer to the nearest tenth of a kilogram.

A 1600kg elephant would be given _____ kg of food.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

2.4 Interpretation of Linear Correlation

Question:

Which of the following distributions suggests a linear correlation of the data?

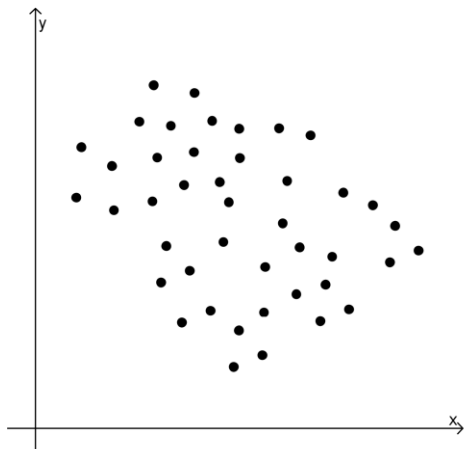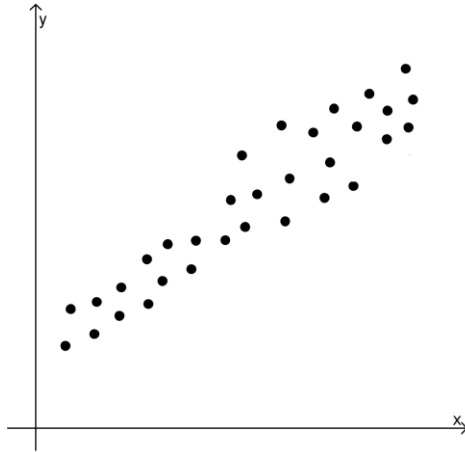A)
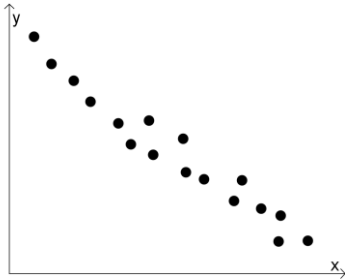
B)
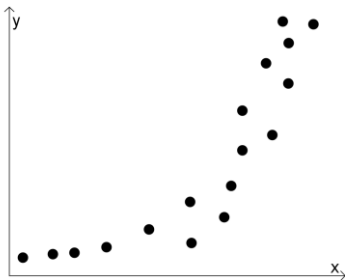
C)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

The following graphs show the relationship between two unknown variables.

Which graph allows for the best prediction to be made?

A)

B)

C)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

The linear correlation coefficient between two variables is –0.93.

Which of the following best describes the correlation?

A)   The correlation between the two variables is strong and positive.

B)   The correlation between the two variables is strong and negative.

C)   The correlation between the two variables is weak and positive.

D)   The correlation between the two variables is weak and negative.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

The linear correlation between two variables is positive and weak. Which of the following could represent the correlation coefficient?

A)   0.32

B)   0.87

C)   −0.26

D)   −0.91
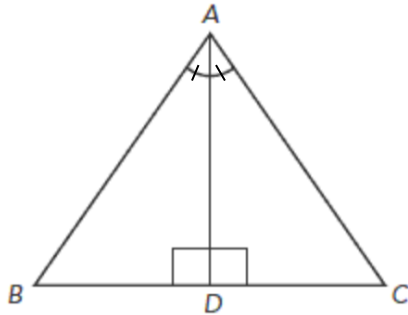
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the scatterplot below.   Which of the following could best describe the linear correlation between the two variables?

A)   Strong and positive

B)   Strong and negative

C)   Weak and positive

D)   Weak and negative

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the scatterplot below.   Which of the following could best describe the linear correlation coefficient between the two variables?
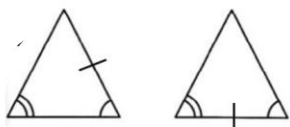

A)   0.29

B)   0.83

C)   −0.45

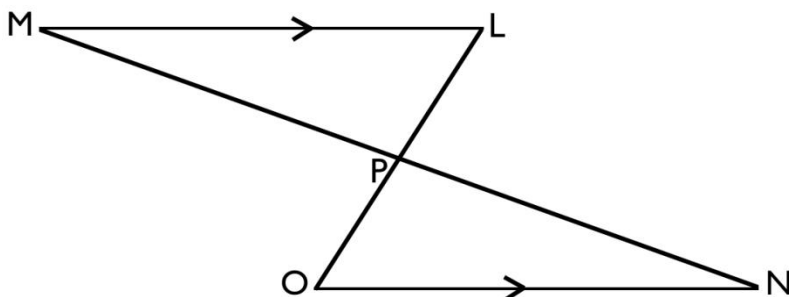D)   −0.79

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A class of secondary 4 students measured their foot lengths and their heights. They then found a linear regression equation for their data. This equation would be used to predict the foot length of Marco, who was absent the day the data was collected.

Data Collected

Foot length (cm)	Height (cm)	Foot length (cm)	Height (cm)
22	154	25.5	170
22	151	25.5	173
23	155	26	167
23.5	165	27	174
24	160	27.5	175
24	158	28	176
24.5	165	28	183
25	161	28.5	185
25	163	29	190
25.5	164	29.5	186

Marco is 181 cm tall.

What is the predicted length of Marco's foot?

Marco's predicted foot length is _____.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

1.1 Congruent Triangles

Question:

Which of the following pairs of triangles is not necessarily congruent?
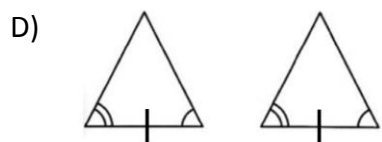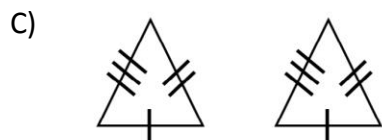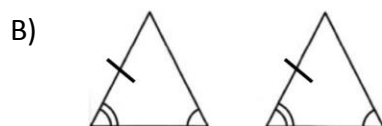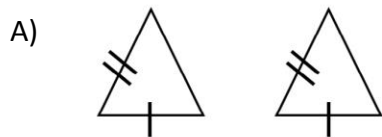
A)

B)

C)

D)

## General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the following diagram.

What theorem can be used to show that ΔABD is necessarily congruent to ΔACD?

A)   SSS

B)   SAS

C)   ASA

D)   None, they are not necessarily congruent.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question

Which of the following pairs of triangles is necessarily congruent?
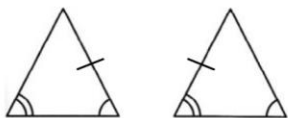
A)

B)

C)

D)

1. Read the question.
2. Highlight key words.
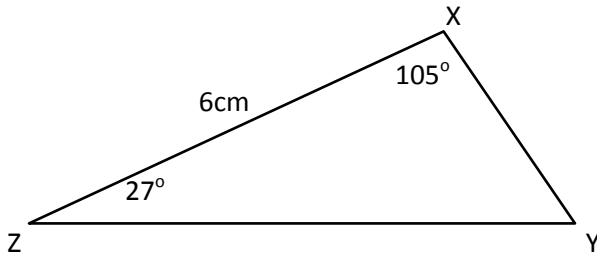3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Point P is the midpoint of line segment MN. Segment ML is parallel to segment ON. Triangles ΔLMP and ΔONP are congruent.

Using SSS, SAS or ASA, identify three pairs of congruent lines or angles that prove the triangles are congruent.

_____ ≅ _____

_____ ≅ _____

_____ ≅ _____

ΔLMP ≅ ΔONP by _____

Question:

Consider the following diagram.
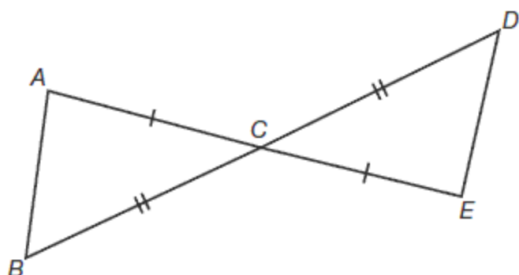
Prove that ΔABC is necessarily congruent to ΔEDC.

_____ ≅ _____

_____ ≅ _____

_____ ≅ _____

ΔABC ≅ ΔEDC by _____

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

You've been hired to paint a team logo on a field for a sporting event. The logo consists of two congruent triangles.
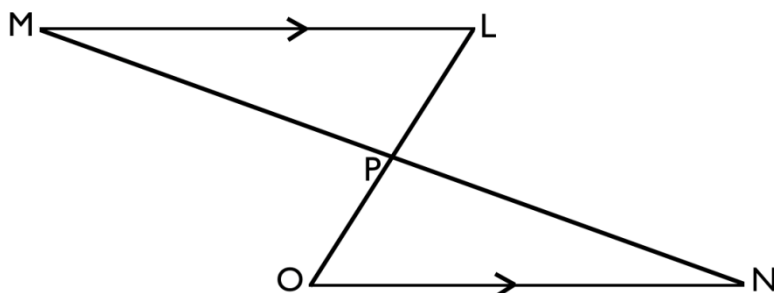
Here is the information you have:

- Point P is the midpoint of $\overline{MN}$
- M is located at (-60, 48)
- N is located at (28, 4)
- ∠LPM measures 95°
- ∠LMP measures 15°

measurements are in meters

You charge $5 per m² for doing the painting (round your measurements to the nearest m²).

What will you charge in total for painting the two triangles that make up the logo?

You will charge _____ for painting the two triangles that make up the logo.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

3.2 Similar Triangles

Question:

The diagram below illustrates two triangles in which the measurements of some sides are given and $\overline{AB} \parallel \overline{DE}$.
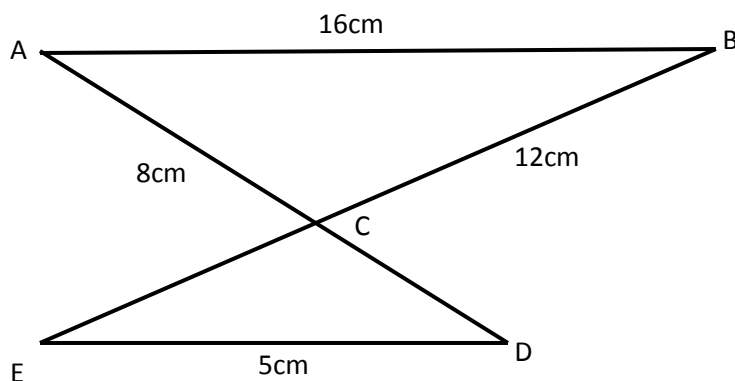
What is the length of segment BE?

A)   2.5 cm

B)   3.75 cm

C)   14.5 cm

D)   15.75 cm

Question:

Triangle XYZ is shown below.

X

105°

6cm

27°

Z   Y

Which of the triangles below is necessarily similar to triangle XYZ?
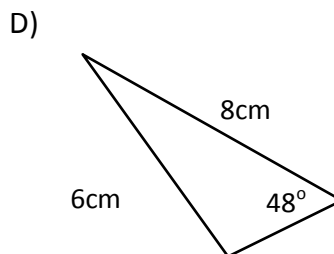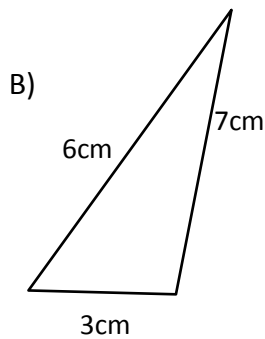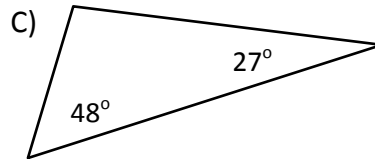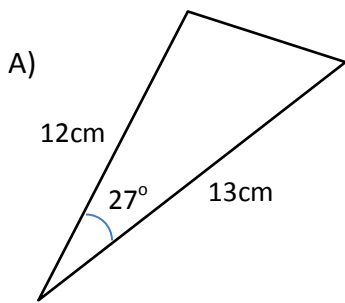
A)

12cm

27°   13cm

C)

27°

48°

B)

7cm

6cm

3cm

D)

8cm

6cm   48°

Question:

In the diagram below, $\overline{BD}$ and $\overline{AE}$ intersect at C

Other measurements are given:

$m\overline{AC} = 30m$
$m\overline{BC} = 25m$
$m\overline{CD} = 15m$
$m\overline{CE} = 18m$

A

30m

B

C　15m

D

25m

18m

E
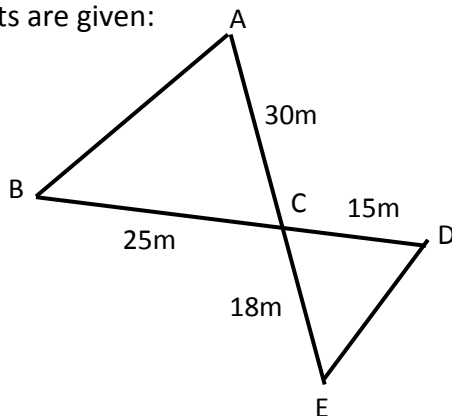
Which of the following statements could be used to prove that triangle ABC is similar to triangle EDC?

A)　Two triangles with corresponding angles congruent are similar. (AA)

B)　Two triangles whose measures of corresponding sides are proportional, are similar. (SSS)

C)　If two angles of one triangle are congruent to two angles of another triangle, and the contained sides are proportional, then the triangles are similar. (ASA)

D)　Two triangles having a congruent angle contained between the corresponding sides of proportional lengths are similar. (SAS)

General Strategies:

1. Read the question
2. Highlight key words
3. Identify the math topic
4. Re-read the question
5. Refer to your memory aid, as needed
6. Look carefully at each choice shown (A, then B, then C and then D)
7. Eliminate options you know to be incorrect
8. Solve/check each possible choice
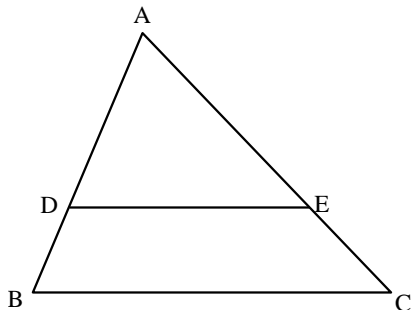9. Select the choice that makes the most sense

Do not leave a blank! Make a choice!

My Strategies:

Question:

In the figure below, triangles ABC and ADE are similar.

$\overline{DE}$ is parallel to $\overline{BC}$,
$m\overline{DE}$ = 20 m,
$m\overline{BC}$ = 35 m
and
$m\overline{AE}$ = 24 m.

A

D ———————— E

B   C

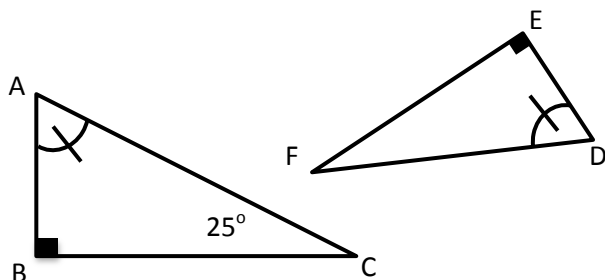What is the length of segment EC?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
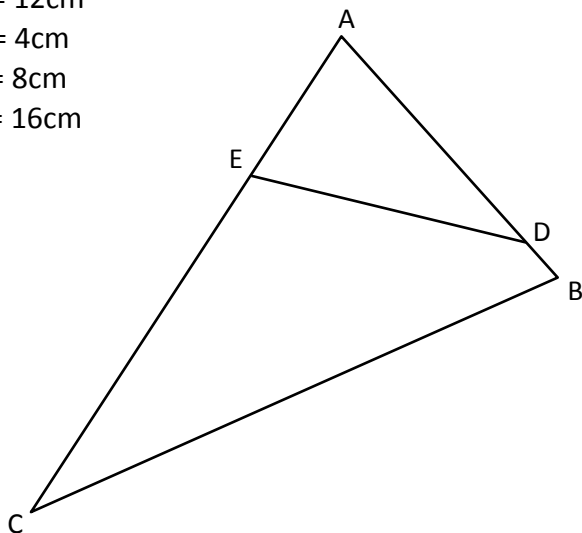9. Write your answer.
Do not leave a blank!

My Strategies:

The length of segment EC is _____ m.

Question:

The following information is given about right triangles ABC and DEF:

What is the measure of $\angle D$?

The measure of $\angle D$ is _____.

Question:

The following measures are given for the figure below:

$m\overline{AD}$ = 12cm
$m\overline{DB}$ = 4cm
$m\overline{AE}$ = 8cm
$m\overline{EC}$ = 16cm

Is triangle $\Delta ABC\ similar\ to\ \Delta AED$?

Note: The figure is not necessarily drawn to scale.

☐ Yes, triangle $\Delta ABC\ is\ similar\ to\ \Delta AED$?

☐ No, triangle $\Delta ABC\ is\ not\ similar\ to\ \Delta AED$?

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.
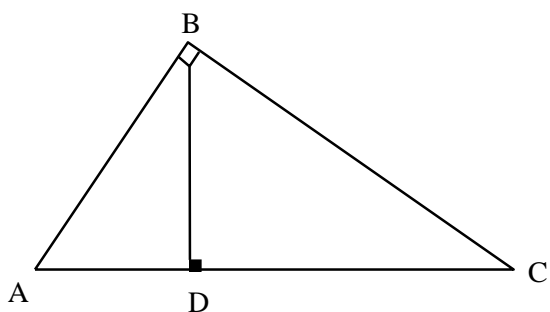
Show any or all your work! Do not leave a blank page!

My Strategies:

3.3 Metric Relations (Right Triangles)

Question:

The following information about triangle ABC below is known:

- $m\angle ABC = 90°$
- $\overline{BD}$ is an altitude
- $m\,\overline{AB} = 60$ m
- $m\,\overline{BC} = 80$ m

What is the measure of altitude $\overline{BD}$?

A)   36 m

B)   48 m

C)   64 m

D)   69 m

Question:

Triangle ABC has the following properties:

- m∠ACB = 90°
- $\overline{DC}$ is an altitude
- m $\overline{DB}$ = 45 m
- m $\overline{AD}$ =12 m
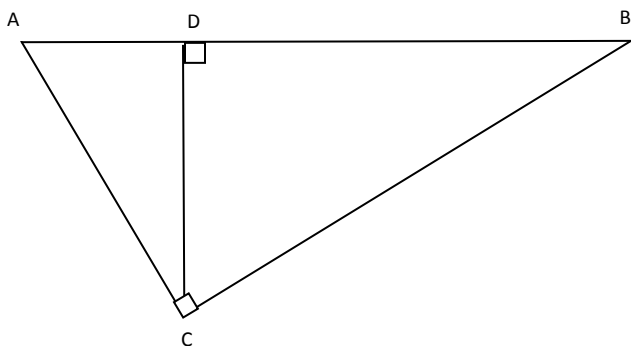
What is the area of ΔABC?

A)   139 m^2

B)   523 m^2

C)   662 m^2

D)   1325 m^2

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
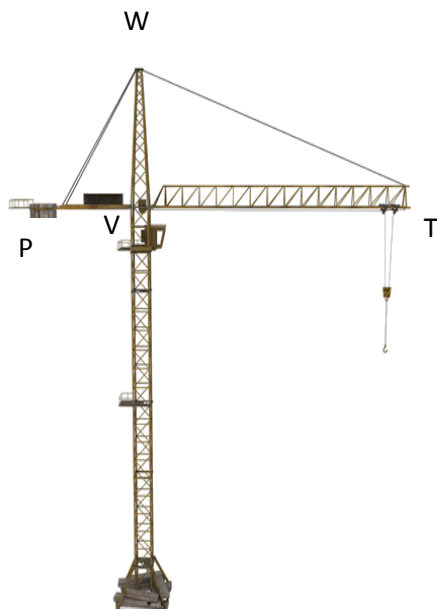8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A construction crane pictured below, has the following measurements:

- m $\angle$ TWP = 90°
- $\overline{VW}$ is an altitude
- m $\overline{VW}$ = 50 metres
- m $\overline{TV}$ = 70 metres

What is the measure of angle WPV to the nearest tenth of a degree?

The measure of angle WPV is _____.

Question:

Triangle ABC has the following properties:

- m∠BCA = 90°
- $\overline{CD}$ is an altitude
- m $\overline{AB}$ = 20 m
- m $\overline{BC}$ = 10 m

What is the measure of $\overline{AD}$?

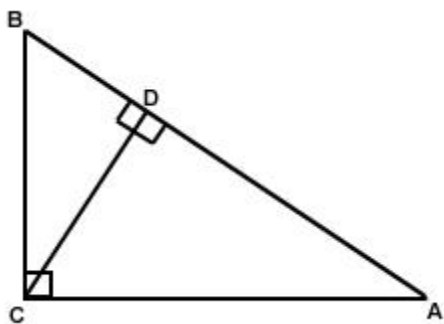The measure of $\overline{DA}$ is _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

A group of Brazilian soccer players are practicing their passes before a game. Their coach illustrates on a Cartesian plane a possible game scenario by showing the players as vertices of three similar right angle triangles.

F

y

P

Z

K

Angle ZKF is a right angle

x
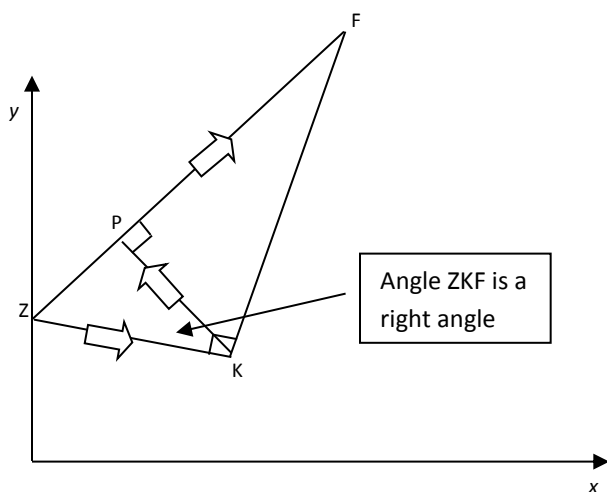
The coach places the player Zico on the sideline (*y*-axis) to perform a throw-in to the player Kaka, who would pass the ball to Pele located at the coordinates (15, 60) followed by a pass to Falcao located at (60, 90). Units are in meters.

What is the total combined distance of all three passes?

The total combined distance is _____ meters.

Question:

A group of engineers is planning the construction of the new Champlain Bridge in Montreal. Below is a diagram of a section of the bridge.

The bridge's towers ($\overline{BD}$ and $\overline{EC}$) are each 100 meters in height and one of the support cables (AB) measures 110 meters.

Also, m $\angle$ ABC and m $\angle$ DEF are both 90° and the towers are perpendicular to the base of the bridge.
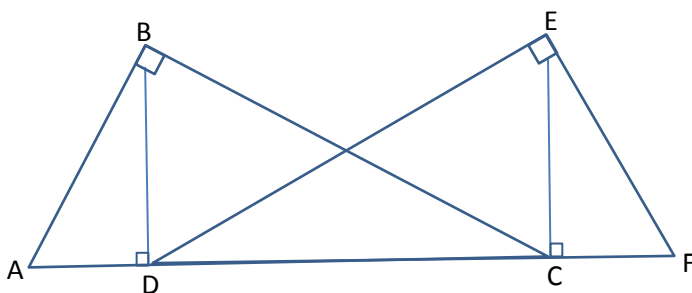
To the nearest whole number, what is the length of the cable represented by segment DE?

The length of the cable represented *by* $\overline{DE}$ is_____m.

4.1 Real Functions

Question:

In a laboratory, scientists are recording the growth rate of cells. They report that a sample of 50 cells doubled every hour.

Which of the following rules describes the relationship?

A) $f(x) = 50(x^2)$

B) $f(x) = 50(2^x)$

C) $f(x) = 50 + 2x$

D) $f(x) = 2(50^x)$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A small town in Quebec already received 120 mm of rain this year when a severe storm occurred. During the storm, rain fell at a constant rate of 5 mm per hour.

The graphs below relate the number of hours since the storm began with the accumulated rainfall in mm.

Which graph below correctly illustrates the relationship?
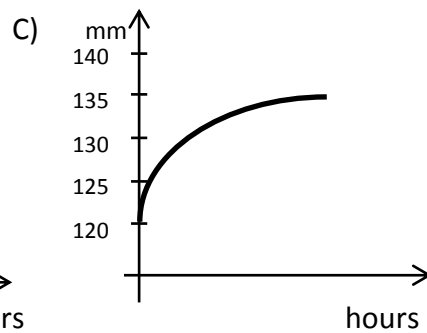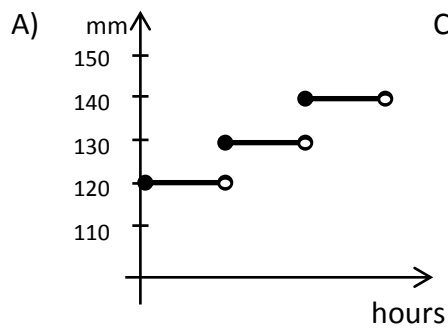
A)

B)

C)

D)

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.
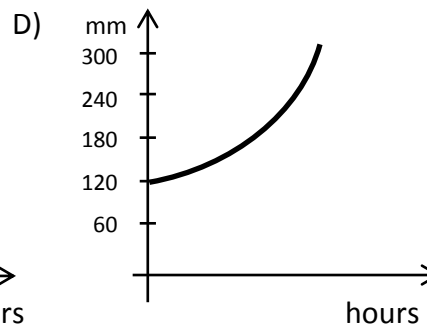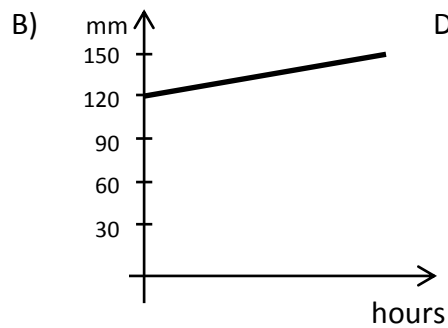
Do not leave a blank!
Make a choice!

My Strategies:

Question:

The graph below illustrates a piecewise function whose domain is $[0, +\infty[$.

Which of the following statements is TRUE?

A)   The function has no *x*-intercept.

B)   The function has no *y*-intercept.

C)   The function is negative over the interval [0.5, 1.5].

D)   The function has no extrema.

Question:

Which of the rules below corresponds to the following graph?

A) $f(x) = 4x + 3$

B) $f(x) = \left(\frac{4}{3}\right)^x$

C) $f(x) = 4x^2 + 3$

D) $f(x) = \frac{43}{x}$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

What is the range of the function below?
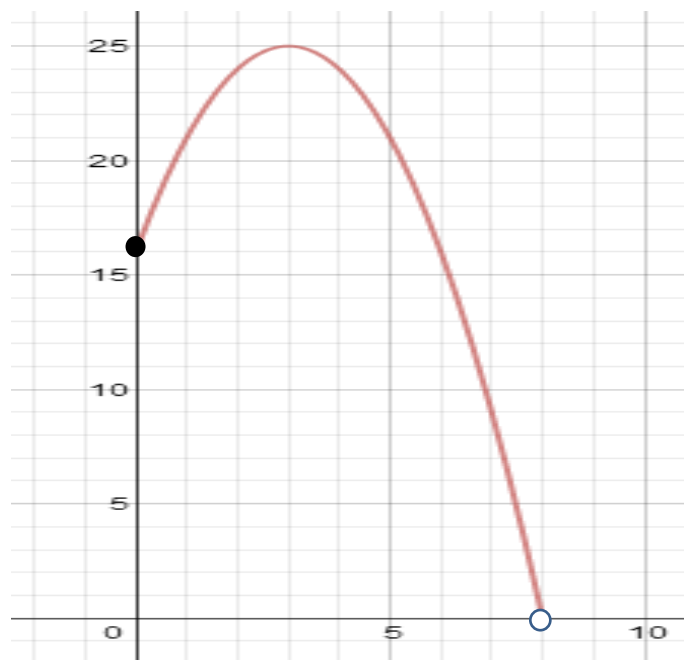
The range of the function is _____.

Question:

A yard and garden care contractor has developed a mathematical model to determine the price he will charge his clients throughout the season. In order to get his clients interested in his service, he gradually increases his price per hour as the hours accumulate.

He illustrates this model in the graph below.

price $

Number of hours
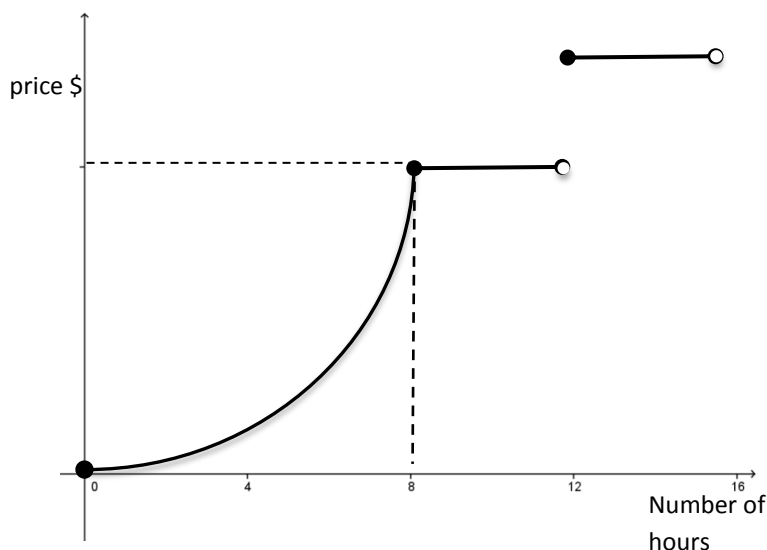
The first piece of the function is a second-degree polynomial function given by the following rule:

$$g(x) = 10x^2 \qquad \text{where } 0 \le x \le 8$$

The price will remain constant for the next 4 hours but after 12 hours, the contractor charges a flat rate of $250 for every four hours of work or part thereof.

One client is charged $1640.

What are the possible numbers of hours that job would have taken?

That job would have taken between _____ and _____ hours.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

4.2 Second-Degree Polynomial Function

Question:

Consider the following function:

$$f(x) = 2x^2$$

Which of the following graphs represents the function?

A)
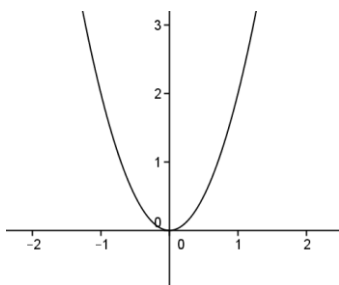
B)
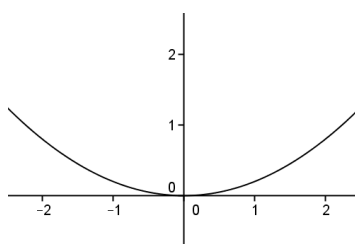
C)
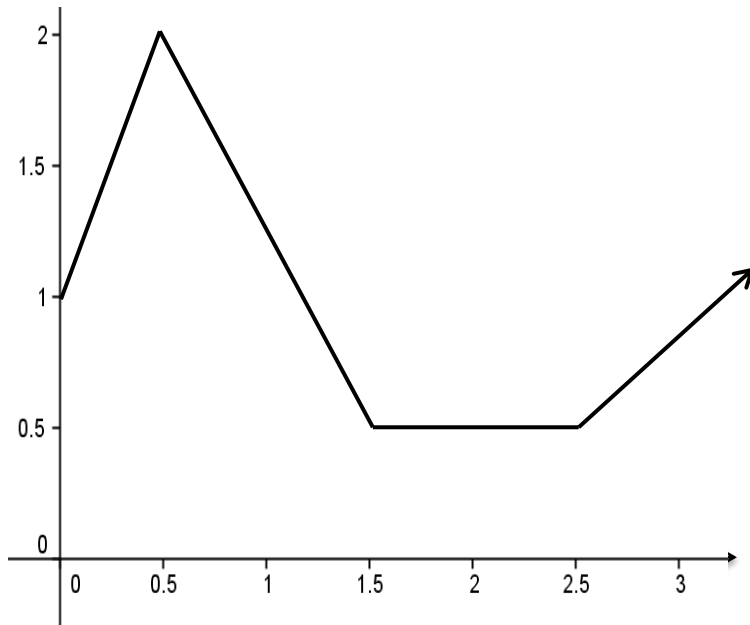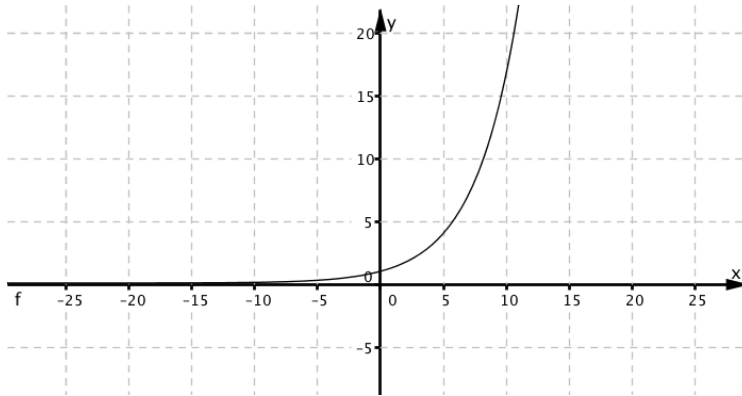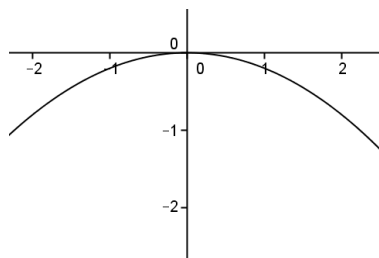

D)
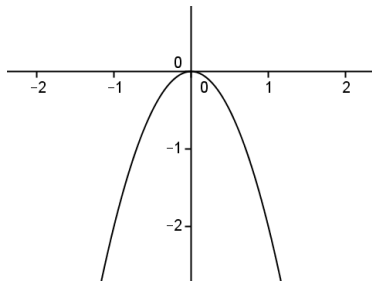
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Which rule represents the following graph?

(4, −4)
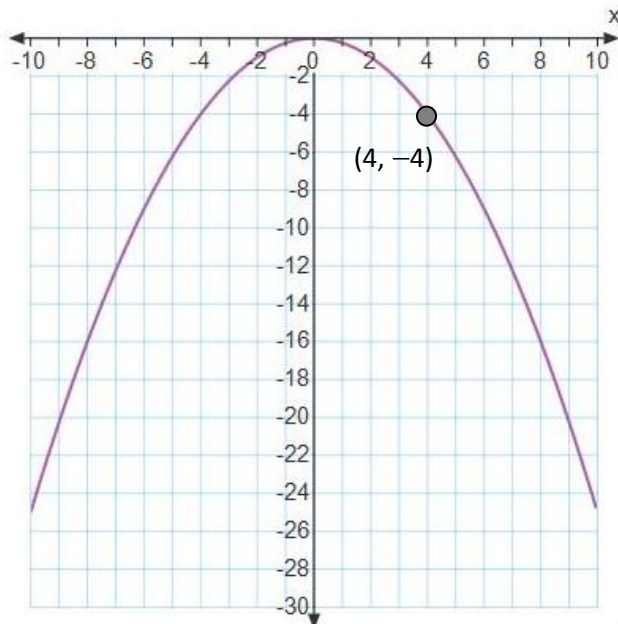
A) $y = 0.25x^2$

B) $y = -0.25x^2$

C) $y = -0.25^x$

D) $y = 0.25x + 1$

Question:

Consider the following table of values for a quadratic function.

x	$f(x)$
- 5	7.5
0	0
5	7.5
10	30
15	67.5
20	120

Which of the following rules represents the quadratic function?

A) $f(x) = -3x^2$

B) $f(x) = -0.3x^2$

C) $f(x) = 0.3x^2$

D) $f(x) = 3x^2$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Point P (5, 10) is on the curve of the 2nd degree function below.

What is the rule of the function?
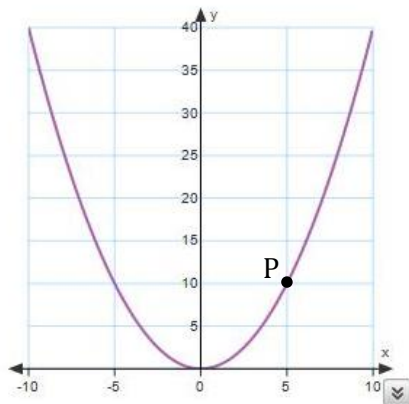
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The rule of the function is _____.

Question:

Match the second degree functions to their respective graphs.

Function	Graph
A) $y = 5x^2$	
B) $y = -0.2x^2$	
C) $y = x^2$	
D) $y = -x^2$	

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Gordon is responsible for repairing the soccer field. He needs to purchase a square piece of turf that measures 22.5 m by 22.5 m. He finds the following 2 deals from two different companies:

Company A:

The turf is sold in square pieces and the price is calculated according to its area.

Examples of Cost Based on the Rule Using Length of Side

Side length of turf piece	Cost
10 m	$ 1 800
17 m	$ 5 202
25 m	$11 250

Company B:

The turf is also sold by area but the pieces are not necessarily square.
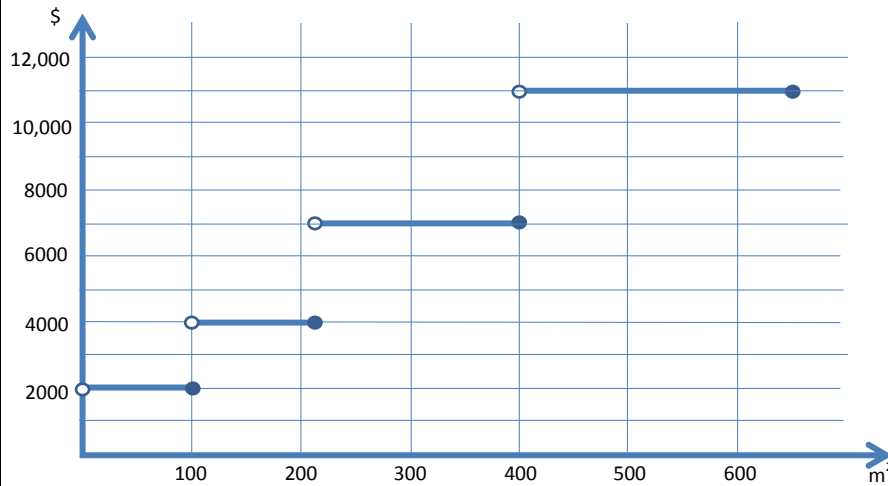
Gordon will buy the piece of turf from the company with the lowest price.

How much will Gordon pay for the piece of turf?

4.3 Exponential Function

Question:

A house, initially valued at $275 000, increases in value by 2% annually.

Let:

    x :   represent the number of years and
    $f(x)$:   represent the value of the house,

Which of the following equations defines this situation?

A) $f(x) = 275\ 000\ (0.02)^x$

B) $f(x) = 275\ 000\ (1.02)^x$

C) $f(x) = 275\ 000\ (1.2)^x$

D) $f(x) = 275\ 000(0.98)^x$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Given the exponential function $f(x) = 505 \, (0.94)^x$,
Where,
    x : represent the numbers of years since 2010
    $f(x)$: represent the cost of the bike

Which of the following statements is true?

A)   The initial value is 0.94.

B)   The bike's value decreases by 94% yearly.

C)   The function is increasing.

D)   In the year 2020, the value of the bike will be $272.
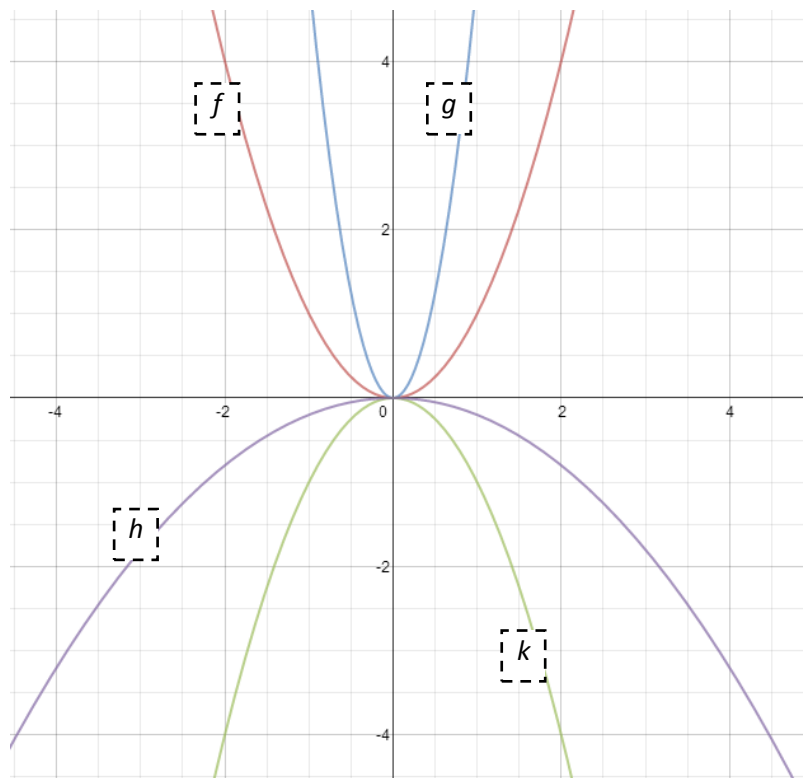
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

The value of a video game depreciates 35% yearly. In 5 years, the price of the video game will be $10.21.

What is the initial price of the video game?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The initial price of video game is _____.

Question:

The function f described below represents the number of bacteria in a well, in relation to the amount of time elapsed since 2005.

$f(x)= 4500 \, (1.33)^x$

where:

    x is the number of years elapsed since 2005
    $f(x)$ is the number of bacteria

In what year will the number of bacteria be 137 858?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

In _____ the number of bacteria will be 137 858.

Question:

Sophia invested $5000 today. Her investment will increase by 2.5% each year.

How much profit will she have made in 10 years?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Sophia will have made _____ profit in 10 years.

Question:

Amy and Ben have deposited money in different banks.

Amy initially deposited $400 in the bank, and deposits $10 into her account every month. No interest is earned.

Ben made a one-time investment of $850 at a yearly interest rate of 4%.

Who will have more money saved after 5 years?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

_____ will have more money after 5 years.

Question:

A study examined the populations of four neighboring towns.

<u>Town A</u>
In 1960, Town A had 5000 inhabitants. Since then, there has been an equal amount of births as there have been deaths and the number of people moving away has matched the number of people moving to the town.

<u>Town B</u>
Function f described below represents the population of Town B in relation to the time elapsed since 2001.
$f(x) = 2000 (1.022)^x$
where:
  x represents time elapsed since 2001, in years
  $f(x)$ represents the population of Town B

<u>Town C</u>
In 2010, Town C had 5000 inhabitants. The population has decreased by 50 inhabitants every year.

<u>Town D</u>
In 2006, Town D had a population of 1500. It is estimated that the population will increase by 5% annually.

The four towns will be merged in 2020 to form one city.

What will the population of the new city be when it is formed in 2020?

The population of the new city will be _____.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

4.4 Step, Periodic and Piecewise Functions

Question:

The following graph represents a periodic function.
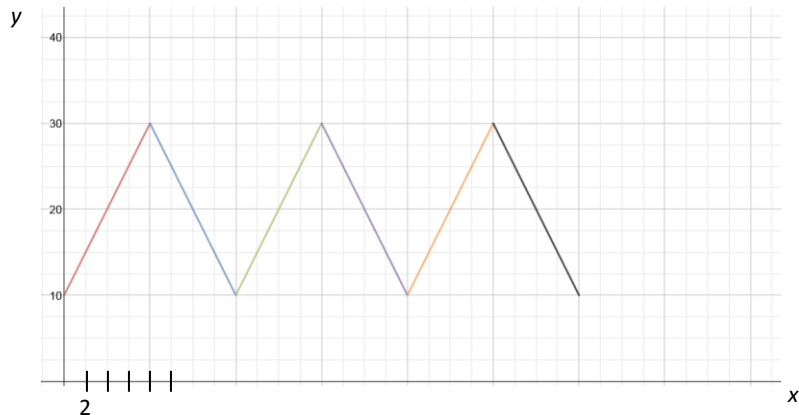
What is the period of this function?

A)   8

B)   16

C)   24

D)   48

Question:

A store offers a discount of $5 for every $50 in purchases. The graph below illustrates the relation between the value of the purchases and the amount of discount a customer receives.

Discount Amount
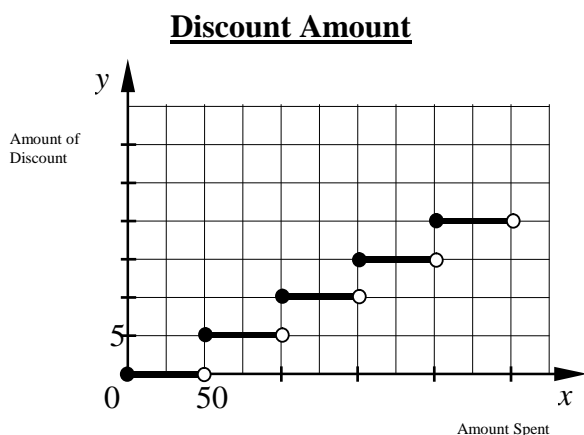
Consider the following five statements regarding the graph.

1.   A customer who spends $150 will receive a $10 discount.
2.   A customer who spends $75 will receive a $5 discount.
3.   A customer will receive a $5 discount when spending less than $100.
4.   A customer will receive twice as much of a discount when spending $200 than $100.
5.   A customer will receive no discount when spending less than $50.

Which of the statements above are true?

A)   2, 4 and 5

B)   2, 3 and 4

C)   1, 2 and 4

D)   1, 2 and 3

General Strategies:

1.   Read the question.
2.   Highlight key words.
3.   Identify the math topic.
4.   Re-read the question.
5.   Refer to your memory aid, as needed.
6.   Solve the problem without looking at choices shown (A, B, C and D).
7.   Look at all the choices.
8.   Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

The cost to park a car in a particularly expensive lot is $40 for the first half hour and $5.00 for each additional hour or part thereof.

A customer uses this parking lot for five hours.

How much will the customer pay for parking?

The customer will pay $_____ for parking 5 hours.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Two companies offer different prices for internet service. Company A uses a linear model where each 100 gigabytes of usage will cost $20. Company B follows a greatest integer function as shown on the graph below.

Internet Plan Cost

Cost ($)

35
30
25
20
15
10
5

0   100   200   300

Amount of Gigabytes

Key
——— Company A
●——○ Company B

What is the difference in cost between the two companies for 200 gigabytes?

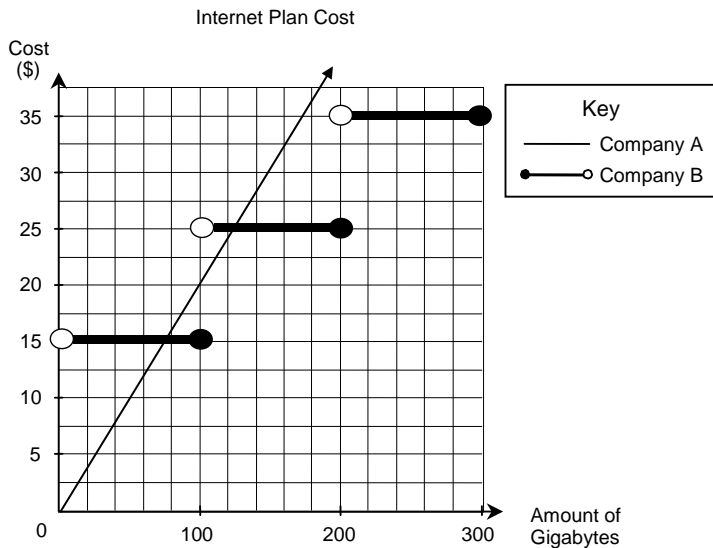The difference in cost is _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.

Do not leave a blank!

My Strategies:

Question:

A store selling World Cup memorabilia places a mechanical mascot in front of the store.

The mascot raises a ball from the ground to a maximum height of 150 cm at a constant rate, holds it there for 20 seconds, and then lowers it back to ground level at the same rate.

The graph below illustrates a periodic function that represents the height, or the distance between the ball and the ground in relation to the time elapsed in seconds.

Height of the Soccer Ball / Distance between the Soccer Ball and the Ground

Height (cm)

200

100

0   100   200   300   400

Time (seconds)
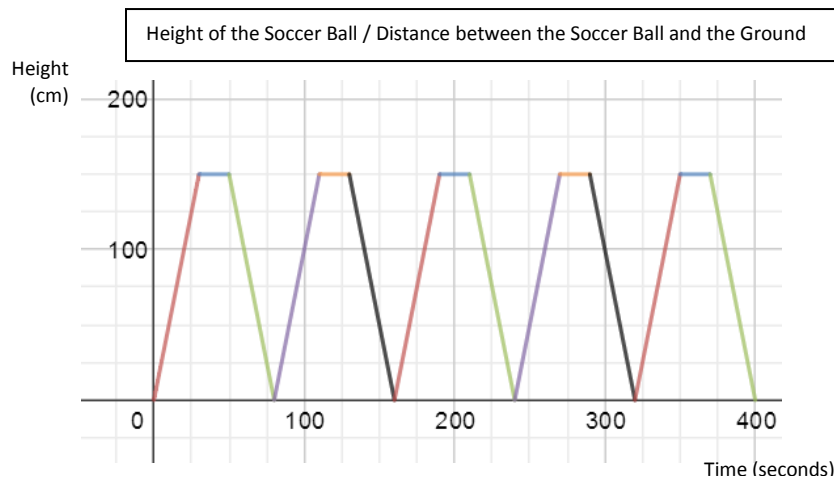
A store employee turns on the mechanism that moves the soccer ball at 8:00AM. At that point the ball is at ground level. At exactly 8:15 AM, the mechanism breaks down and the soccer ball stops moving.

How high above the ground is the ball when the mascot stops moving?

The ball is _____ cm off the ground when the mascot stops moving.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

Question:

The graph below represents the outline of a skateboard ramp which corresponds to a piecewise function defined by:

$$f(x) = \begin{cases} ax^2 & if\ 0 \le x \le 80 \\ 256 & if\ 80 \le x \le 160 \\ -1.25x + b & if\ 160 \le x \le 320 \end{cases}$$

Height (cm)
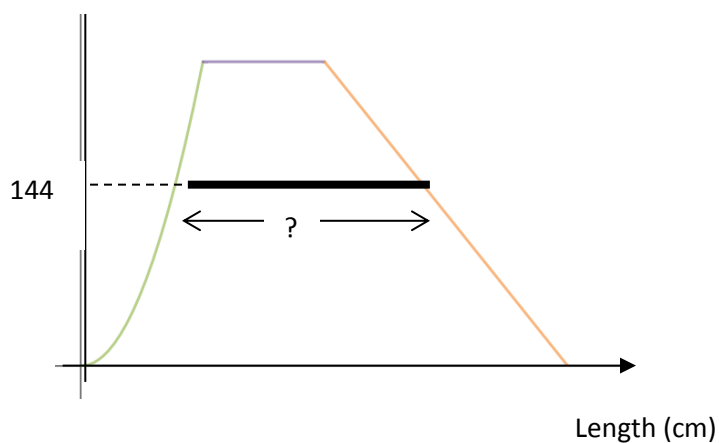
Length (cm)

For security purposes, a strip of reflective tape will be placed on the ramp at a height of 144 cm.

What is the length of this piece of reflective tape?

The length of the piece of reflective tape is _____ cm.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

5.1 Trigonometric Ratios

Question:

Consider the right triangle ABC shown below.
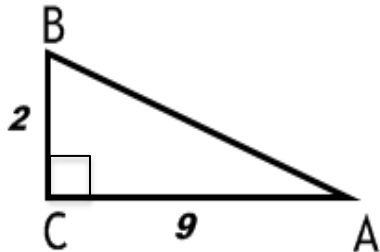
Which of the following expressions represents the correct trigonometric ratio for angle A?

A) $\sin A = \dfrac{9}{2}$

B) $\tan A = \dfrac{9}{2}$

C) $\cos A = \dfrac{2}{9}$

D) $\tan A = \dfrac{2}{9}$

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider right triangle DEF shown below.
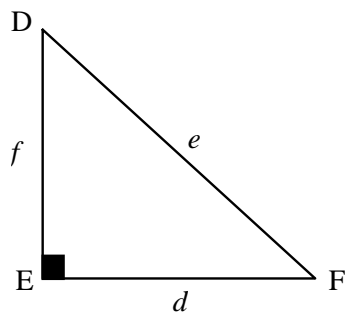
Which trigonometric ratio corresponds to the ratio $\dfrac{d}{e}$?

A)   cos D

B)   tan D

C)   cos F

D)   sin F

Question:

Consider right triangle DEF below.
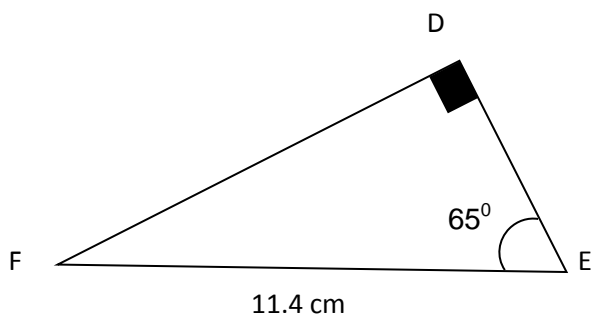
To the nearest hundredth, what is the length of side DF?

A)   4.82 cm

B)   10.33 cm

C)   12.58 cm

D)   24.45 cm

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

During a football practice, player A passes the ball to player B. The diagram below illustrates the pass.

What is the distance traveled by the ball during the pass?
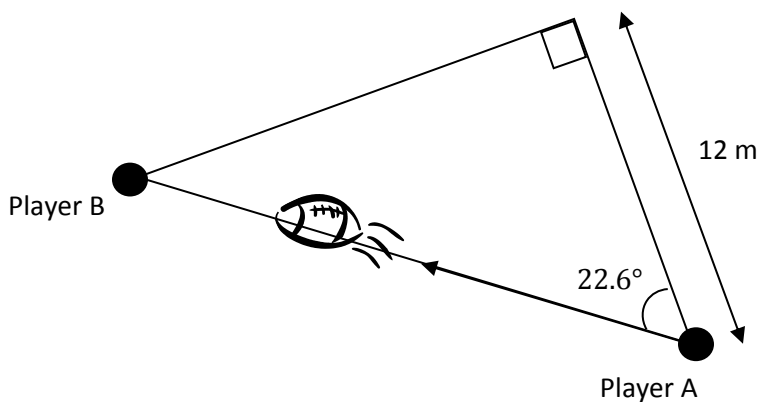
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The distance traveled by the ball during the pass is _____ m.

Question:

In isosceles triangle RST, height QT measures 13.1 cm.

What is the measure of angle R to the nearest tenth?

The measure of angle R is _____.

Question:

In the figure below, triangle BEF and triangle ABC are right triangles.

In addition,

$\overline{DB}$ is an altitude of right triangle ABC
$\overline{AE} \cong \overline{BE}$
m∠$BEF = 36°$
m$\overline{EF} = 15cm$
m$\overline{DB} = 9cm$

The drawing is not to scale.

What is the area of figure AEFC?

A

E

D

9cm

15cm

36°

C   B   F
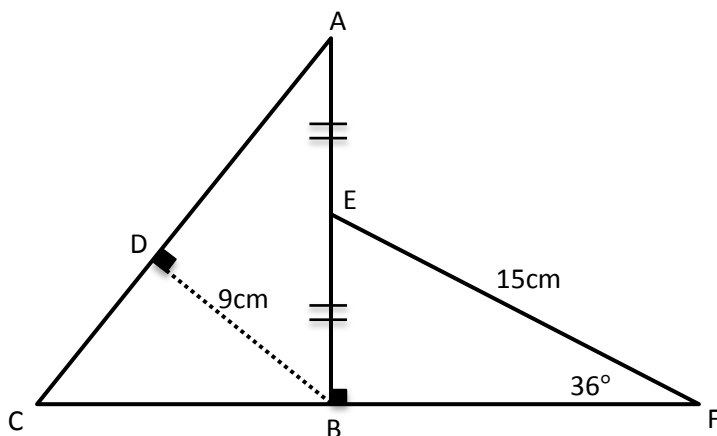
The area of figure AEFC is _____ cm^2.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

5.2 Finding Missing Measurements

Question:

A sheet of construction paper is cut along the dashed lines.

20 cm
?
28 cm
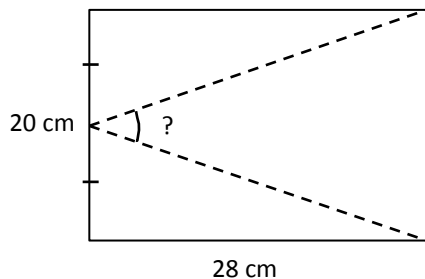
What is the angle formed between the two dashed lines?

A)   19.7°

B)   39.4°

C)   70.3°

D)   140.6°

Question:

A stationary supplier needs to calculate the angle formed by the flap as shown in the diagram. The envelope is 20 cm long and 7 cm wide. The flap folds over a maximum of 3 cm at its center.

What is the measure of this angle?

7 cm

?   3 cm

20 cm
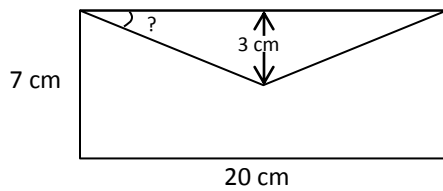
A)   16.7°

B)   17.5°

C)   19.3°

D)   20.5°

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Sylvain wants to paint the surface of his triangular deck.

What is the area to be painted?

16 m

43°
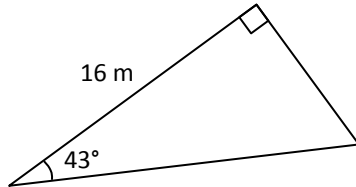
A)   87.3 m^2

B)   93.6 m^2

C)   119.4 m^2

D)   137.3 m^2

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Bird nests are sitting at the top of two poles. Pole A is 11.5 m long and is leaning at an 8° angle from the vertical; Pole B is 11 m long and is leaning at a 5° angle from the vertical.

What is the difference in height between the two bird nests?
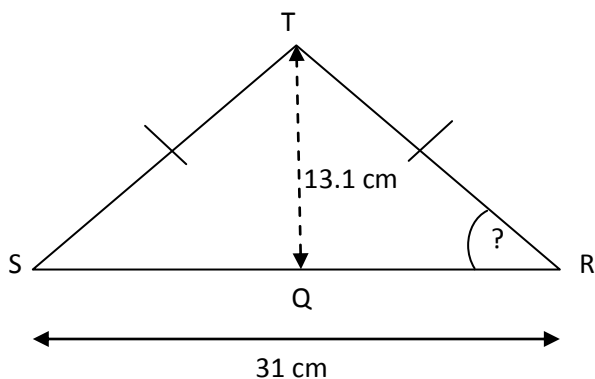
Give your answer to 2 decimal places.
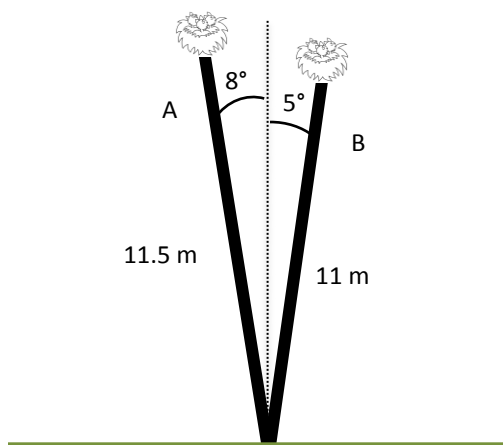
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The difference in height between the two bird nests is _____ m.

Question:

A flagpole is anchored using two guy wires. The guy wire on the right is 18 m long and has an angle of inclination with the ground of 30°. It is attached one meter below the point where the left guy wire is attached to the pole. The left guy wire is located 20 meters from the base of the flagpole.

What is the angle of inclination of the left guy wire?

The angle of inclination of the left guy wire is _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer. Do not leave a blank!

My Strategies:

Question:

In triangle PQR, we have $m\angle P = 42°$; $mPR = 15$; $mQR = 12$

In addition, $\angle PQR$ is an obtuse angle.

P
42°
15
?
Q
12
R
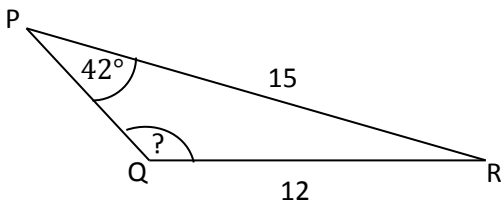
To the nearest integer, what is the measure of $\angle PQR$?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The measure of $\angle PQR$ is _____.

Question:

Sally is flying a kite. The tip of the kite is 60 m above the ground and the kite itself is 2m in length. She is holding the string 1 m above the ground. The angle of inclination of the string started out at 55° but then the wind shifted and the angle of the string shrunk to 40°. In order to maintain the height of the kite, Sally had to let more string out from the spool.

How much string did Sally need to let out to maintain the height of the kite?

Sally had to let out an additional _____ of string to maintain the height of the kite.

5.3 Calculating the Area of any Triangle

Question:

Consider the following diagram of triangle ABC.
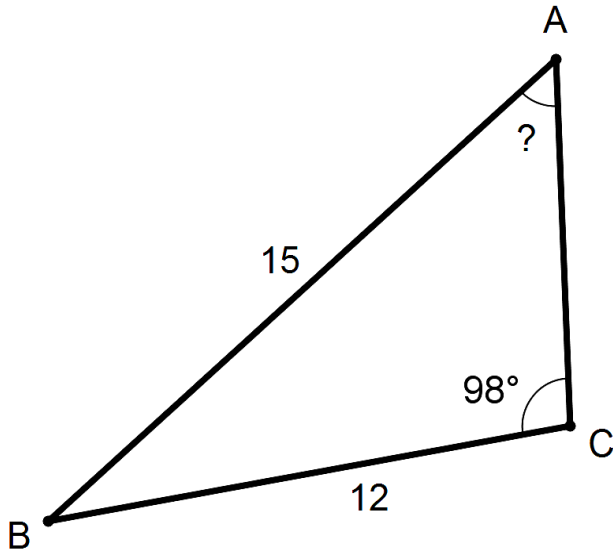
Which of the following best shows the measure of angle CAB?

A)   52.4°

B)   38.7°

C)   53.1°

D)   36.8°

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem __without looking__ at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider the following diagram of triangle ABC. All measurements are in meters.
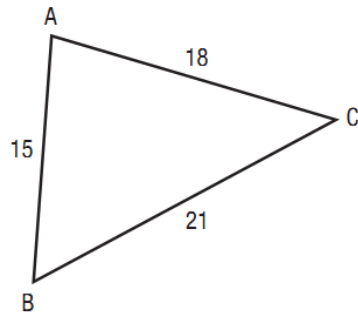
What is the area of triangle ABC?

A)   7.35 m^2

B)   25.5 m^2

C)   132.3 m^2

D)   187.1 m^2

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

Consider triangle ABC shown below.

What is the measure of angle B. Round your answer to the nearest degree.
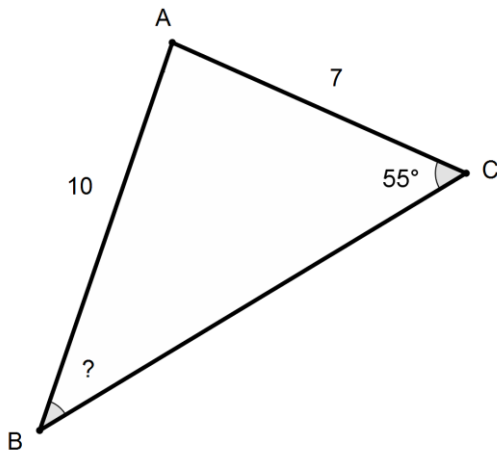
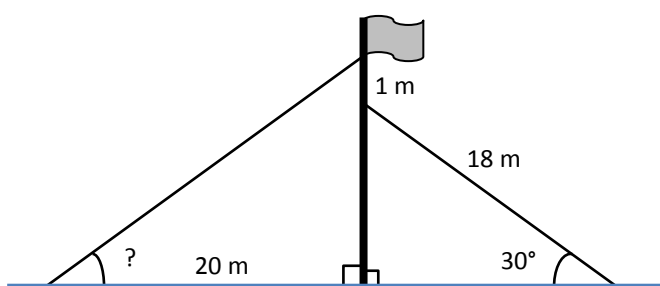The measure of angle B is _____ .

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

What is the area of triangle ABC shown below?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The area of triangle ABC is _____ .

Question:

Consider triangle ABC shown below. What is the length of segment AB? Round your answer to the nearest tenth.
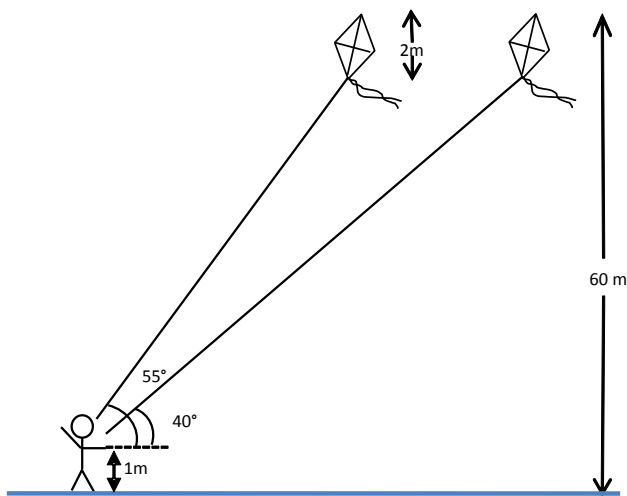
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The length of segment AB is _____ .

Question:

The Space Needle is a tall structure in Seattle, Washington. Phil, a math student, attempts to estimate the height of the Space needle by using a clinometer, a device that measures the angle of inclination.

A

20⁰ ... correction: 20^0

B

$353 m$

C

50^0

D
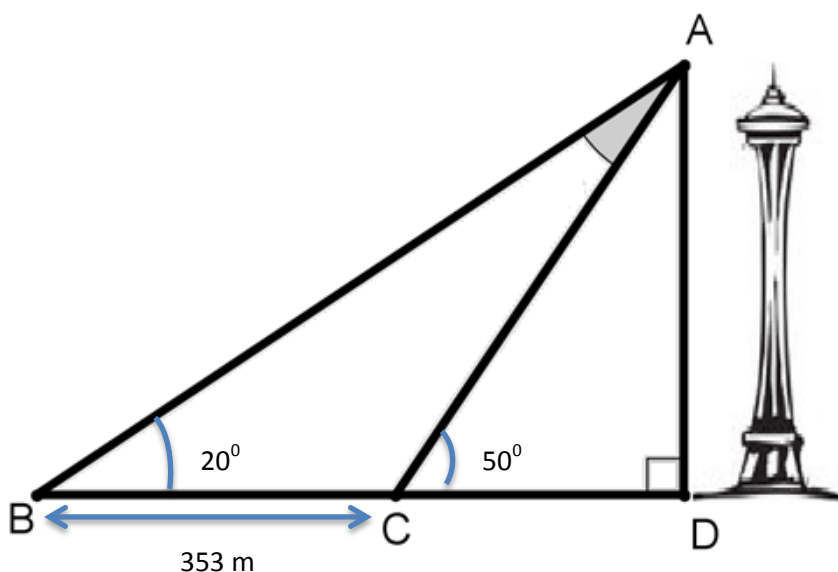
First, Phil stands at point C and reads a 50^0 angle on the clinometer. Then, Phil moves 353 m to Point B and reads an angle of 20^0 on the clinometer. Phil estimates the Space Needle is between 182 m and 188 m in height.

Based on the information given, is Phil's estimation correct? Explain.

☐ Yes, his estimation is correct.

☐ No, his estimation is not correct.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

6.2 Subjective Probability and Odds

Question:

Which of the following is an example of subjective probability?

A)   You are rolling a die. The probability of rolling a 4 is 1/6.

B)   A camera records the cars passing through an intersection. The probability that the next car will be red.

C)   You are waiting for a bus. The probability of it being late is 10%.

D)   You are sitting with your doctor hearing the results of various diagnostic tests. The doctor gives an approximation of your life expectancy.

General Strategies:

1.   Read the question.
2.   Highlight key words.
3.   Identify the math topic.
4.   Re-read the question.
5.   Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6.   Refer to your memory aid, as needed.
7.   Solve.
8.   Ask yourself whether your answer makes sense.
9.   Write your answer.
Do not leave a blank!

My Strategies:

Question:

What are the odds for rolling a 4 on a fair die?

A)   5:1

B)   1:5

C)   1:6

D)   5:6

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer-what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.

Do not leave a blank!

My Strategies:

Question:

A boxer has a 30% chance of winning the championship.

What are his odds against winning?

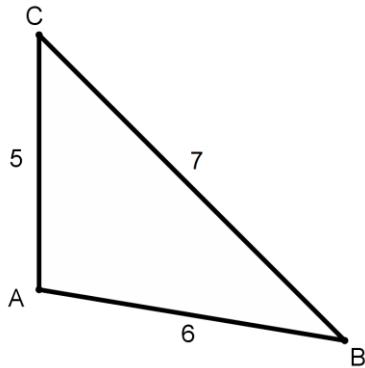The boxer's odds against winning are _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

Sam bets $12 on a horse race. The odds in favor of his horse winning are 4:5.

How much money would Sam collect if his horse wins the race?

Sam would collect $_____ if his horse wins.
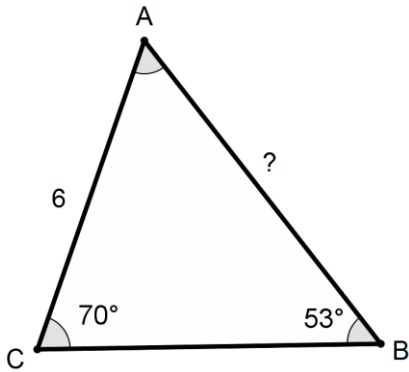
General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

A bag contains 20 marbles that are either blue or yellow.

If a marble is drawn at random from the bag, the odds that the marble will be blue are 1 to 4.

How many yellow marbles are in the bag?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

There are _____ yellow marbles in the bag.

6.3 Mathematical Expectation

Question:

Ralph bets $5 to play a game that involves rolling a die. If he rolls a 5 or higher, he receives $10 plus his bet; otherwise, he loses his bet.

Which statement is true?

A)   The game is to the player's advantage.

B)   The game is fair.

C)   The game is to the player's disadvantage.

D)   The game's fairness cannot be determined.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Look carefully at each choice shown (A, then B, then C and then D).
7. Eliminate options you know to be incorrect.
8. Solve/check each possible choice.
9. Select the choice that makes the most sense.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A box contains ten $5 bills and fifteen $10 bills.

Players must bet $8 in order to play the game.

Players keep the bill they draw from the box.

What is the expected gain of this game?

A)   −1

B)   0

C)   5

D)   8

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Refer to your memory aid, as needed.
6. Solve the problem <u>without looking</u> at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

Do not leave a blank!
Make a choice!

My Strategies:

Question:

A game involves throwing 2 coins.

If a player receives two heads, the player wins $10.

If a player receives two tails, the player wins $20.

If the player receives any other combination, the player loses $5.

What is the expected value?

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

The expected value is _____.

Question:

It costs a smartphone manufacturer $300 to make a phone. The phones they make are either sold to cell phone service companies for $550 each, sold to retail stores for $650 each, sold to employees for a special price of $500 each, given away for promotional purposes or they turn out to be defective and have to be scrapped.

Over the past year, 50% of the phones were sold to cell phone service companies, 45.5% were sold to retail stores, 1% were sold to employees, 0.5% were given away, and 3% were defective and not sold.

The company plans on manufacturing one million phones next year.

What is the company's expected profit for next year?

The company's expected profit for next year is _____.

General Strategies:

1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write your answer.
Do not leave a blank!

My Strategies:

Question:

The Street Festival

Frank is creating a game for people to play at a street festival in the community.

His idea is to have a bag with 9 baseballs, each with a number written on it. The number will represent the dollar amount which will be won by the participant who randomly draws it out of the bag.

The participant pays $3.00 to play the game.

Frank numbered the balls as shown below:

Sue is running the festival and insists that the game be fair or in favour of the participant.

Frank says his game meets that condition. Sue disagrees.

Who is correct?

☐ Frank is correct.

☐ Sue is correct.

General Strategies:

1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your answer makes sense.
10. Write your answer statement.

Show any or all your work! Do not leave a blank page!

My Strategies:

ANSWERS

Page	Question	Section		Answer
10	1	1.1	MC–A	B
12	2	1.1	MC–B	D
14	3	1.1	MC–C	B
16	4	1.1	SA–A	(1000, 1440)
18	5	1.1	SA–B	20.54 m longer
20	6	1.1	AQ	Alan is correct.
24	7	1.2	MC–A	D
26	8	1.2	MC–B	C
28	9	1.2	MC–C	A
30	10	1.2	MC–D	B
32	11	1.2	SA–A	(24, 0)
34	12	1.2	SA-B	$y = -3/4\,x + 13/2$ OR $y = -0.75x + 6.5$
36	13	1.2	SA-C	a) x-int : $-3/2$ b) y-int: -2
38	14	1.2	AQ	15 km
42	15	1.3	MC–A	C
44	16	1.3	MC–B	C
46	17	1.3	MC–C	D
48	18	1.3	AQ	Client C is correct.
52	19	1.4	MC–A	C
54	20	1.4	MC–B	D
56	21	1.4	MC–C	B
58	22	1.4	SA–A	No
60	23	1.4	SA–B	1C, 2B, 3A, 4D
62	24	1.4	AQ	21
66	25	2.1	MC–A	B
68	26	2.1	MC–B	B
70	27	2.1	MC–C	C
72	28	2.1	MC–D	C
74	29	2.1	SA–A	6.49
76	30	2.1	SA–B	a) 76th b) 30 : 34
78	31	2.1	AQ	7 swimmers
82	32	2.2	MC–A	A
84	33	2.2	MC–B	D
86	34	2.2	MC–C	D
88	35	2.2	SA–A	Strong / Positive
90	36	2.2	SA–B	Weak / Negative

Page	Question	Section		Answer
94	37	2.3	MC–A	B
96	38	2.3	MC–B	C
98	39	2.3	MC–C	A
100	40	2.3	SA–A	−0.74 (between −0.76 and −0.69)
102	41	2.3	SA–B	0.67 (between 0.62 and 0.72)
104	42	2.3	AQ	73.9 kg (answers vary)
108	43	2.4	MC–A	A
110	44	2.4	MC–B	B
112	45	2.4	MC–C	B
114	46	2.4	MC–D	A
116	47	2.4	MC–E	D
118	48	2.4	MC–F	B
120	49	2.4	AQ	28 cm (answers vary)
124	50	3.1	MC–A	A
126	51	3.1	MC–B	C
128	52	3.1	MC–C	C
130	53	3.1	SA–A	ASA
132	54	3.1	SA–B	SAS
134	55	3.1	AQ	$3320
138	56	3.2	MC–A	D
140	57	3.2	MC–B	C
142	58	3.2	MC–C	D
144	59	3.2	SA–A	18 m
146	60	3.2	SA–B	65°
148	61	3.2	AQ	Yes
152	62	3.3	MC–A	B
154	63	3.3	MC–B	C
166	64	3.3	SA–A	54.5°
158	65	3.3	SA–B	15 m
160	66	3.3	AQ–A	121.37 m
162	67	3.3	AQ–B	240 m
166	68	4.1	MC–A	B
168	69	4.1	MC–B	B
170	70	4.1	MC–C	A
172	71	4.1	SA–A	B
174	72	4.1	SA–B	]0, 25]
176	73	4.1	AQ	between 24 and 28

Page	Question	Section		Answer
180	74	4.2	MC–A	A
182	75	4.2	MC–B	B
184	76	4.2	MC–C	C
186	77	4.2	SA–A	$y = 0.4x^2$
188	78	4.2	SA–B	a) G b) H c) F d) K
190	79	4.2	AQ	$9 112.50
194	80	4.3	MC–A	B
196	81	4.3	MC–B	D
198	82	4.3	SA–A	$88.02
200	83	4.3	SA–B	137 858 bacteria
202	84	4.3	SA–C	$1400.42
204	85	4.3	SA–D	5 years
206	86	4.3	AQ	15 043
210	87	4.4	MC–A	B
212	88	4.4	MC–B	A
214	89	4.4	SA–A	$65
216	90	4.4	SA–B	$15
218	91	4.4	AQ–A	100 cm
220	92	4.4	AQ–B	a = 1/25 or 0.04 b = 456
224	93	5.1	MC–A	D
226	94	5.1	MC–B	C
228	95	5.1	MC–C	B
230	96	5.1	SA–A	13 m
232	97	5.1	SA–B	40.2°
234	98	5.1	AQ	144.86 cm^2
238	99	5.2	MC–A	B
240	100	5.2	MC–B	A
242	101	5.2	MC–C	C
244	102	5.2	SA–A	0.43 m
246	103	5.2	SA–B	26.6°
248	104	5.2	SA-C	123°
250	105	5.2	AQ	19.1 m

Page	Question	Section		Answer
254	106	5.3	MC–A	A
256	107	5.3	MC–B	C
258	108	5.3	SA–A	35°
260	109	5.3	SA–B	14.7 units^2
262	110	5.3	SA–C	7.06
264	111	5.3	AQ	Yes, 185 m
268	112	6.2	MC–A	D
270	113	6.2	MC–B	B
272	114	6.2	SA–A	7 : 3
274	115	6.2	SA–B	$27
276	116	6.2	SA–C	16
280	117	6.3	MC–A	B
282	118	6.3	MC–B	B
284	119	6.3	SA–A	5
286	120	6.3	SA–B	$275 750 000
288	121	6.3	AQ	Sue is correct as the EV = −1/9