Cultural, Social and Technical Mathematics

Secondary IV

STUDY GUIDE

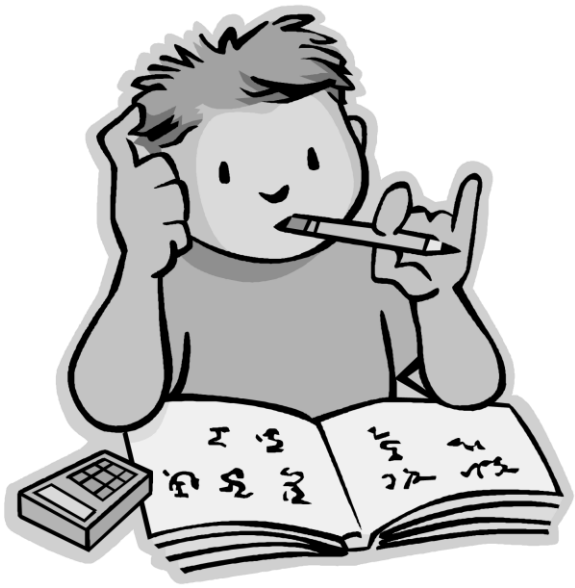


Table of Contents

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.

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 (part to part)**		
How to find the point that divides a line into a given **FRACTION (part to whole)**		
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 **position of two straight lines** (parallel and perpendicular)		
How to translate a story into a **SYSTEM OF EQUATIONS**		
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 solve a system of equations using the **COMPARISON METHOD**		
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		

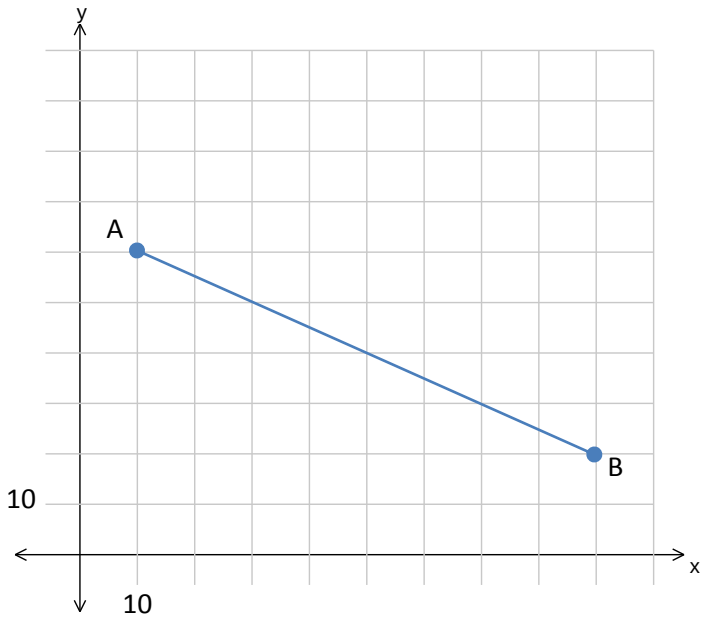
How to find an **angle** measure using **TRIGONOMETRIC RATIOS (SIN, COS, TAN)**		
How to find a **side** measure using **TRIGONOMETRIC RATIOS (SIN, COS, TAN)**		
How to find an **angle or side** measure using **SINE LAW**		
How to find the **AREA OF A TRIANGLE**- all three methods:		
• General formula		
• 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**		

1.1 Points and Segments in the Cartesian Plane

QUESTION 1 1.1-MC-A

Question:

What is the slope of line segment AB?



A) -2

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

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

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 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 2 1.1-MC-B

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 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 3 1.1-MC-C

Question:

The coordinates of points A and B are A (10, 30) and B (25, 75).

From point B, point P is located $\frac{3}{5}$ of the way along line segment BA.

Which of the following represents the coordinates of 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 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 4 1.1-SA-A

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?

Jim's house is situated at (,).

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.

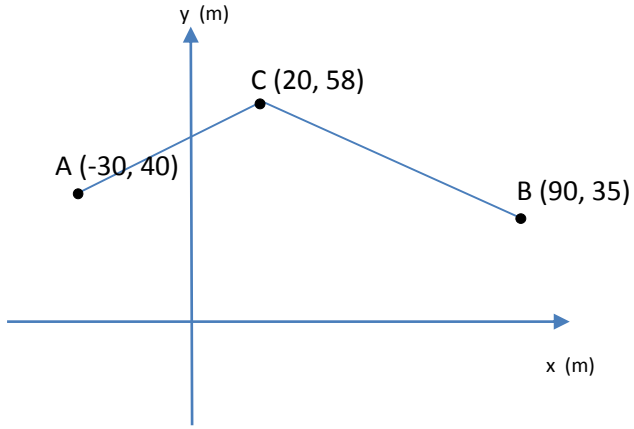
Do not leave a blank!

My Strategies:

QUESTION 5 1.1-SA-B

Question:

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



$\overline{BC}$ 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.

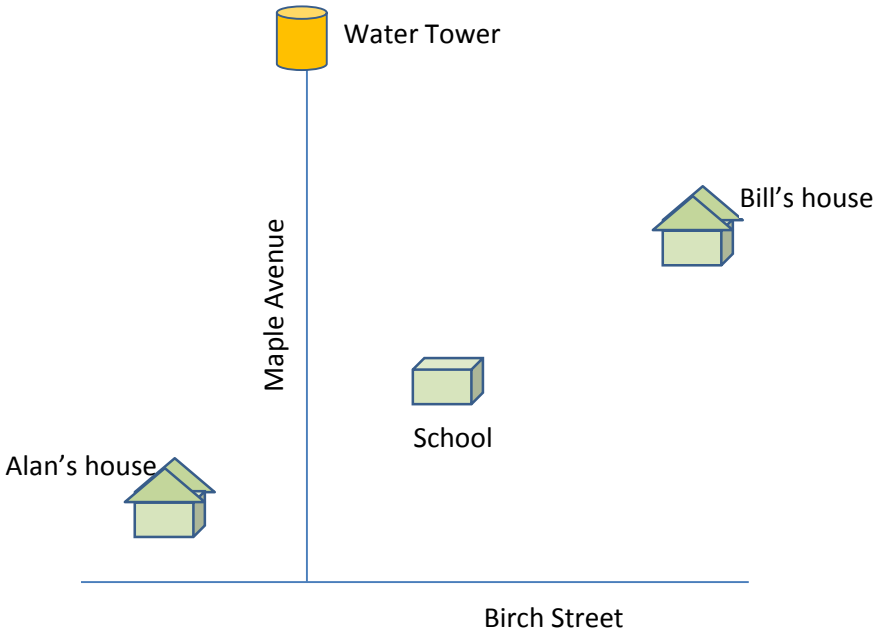
He starts by making Birch St. the x-axis and Maple Ave. the y-axis since they are perpendicular to each other.

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:

QUESTION 7 1.2-MC-A

Question:

The slope of line l is $\frac{3}{7}$ and it passes through point (7, 8).

What is the equation of line l?

A) $y = \frac{3}{7}x + 5$

B) $y = \frac{3}{7}x + 11$

C) $y = \frac{3}{7}x + \frac{25}{7}$

D) $y = 5x + \frac{3}{7}$

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 8 1.2-MC-B

Question:

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

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

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

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

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 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 9 1.2-MC-C

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 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 10 1.2-MC-D

Question:

What is the equation of the line parallel to
$3x - 4y - 24 = 0$ that passes through point P $(-8, 7)$?

A) $y = \frac{3}{4}x + \frac{13}{4}$

B) $y = \frac{3}{4}x + 13$

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

D) $y = -\frac{4}{3}x - \frac{13}{3}$

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 11 1.2-SA-A

Question:

Line L_1 passes P (12, 15) and is perpendicular to line L_2
Line L_2 has equation $-4x + 5y - 10 = 0$.

What is the x-intercept of the line L_1?

The x-intercept of the line L_1 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 12 1.2-SA-B

Question:

Line L_1 has a slope of $\frac{4}{3}$ and a *y*-intercept of -3.

Line L_2 is perpendicular to line L_1 and passes through point (2, 5).

What is the equation of line L_2?

The equation of line L_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 13 1.2-SA-C

Question:

Given the equation:

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

A) What is the *x*-intercept?

B) What is the *y*-intercept?

The *x*-intercept is _____

The *y*-intercept 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 14 1.2-AQ

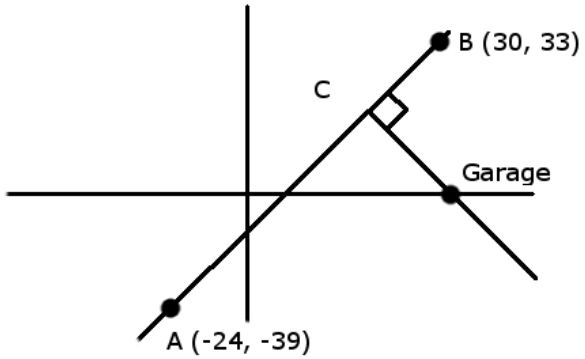
Question:

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 15 1.3-MC-A

Question:

Consider the following system of linear equations.

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

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

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 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 16 1.3-MC-B

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 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 17 1.3-MC-C

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 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:

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:

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

QUESTION 25 2.1-MC-A

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

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 26 2.1-MC-B

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 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 27 2.1-MC-C

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 he is ranked in the 70^{th} 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 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 28 2.1-MC-D

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 29 2.1-SA-A

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?

The mean deviation for the set of data 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 30 2.1-SA-B

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 a runner with a finishing time of 28 minutes 45 seconds?

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

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

The finishing time of the runner ranked in the 60^{th} 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 31 2.1-AQ

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 criteria:

Criteria 1
The swimmer must rank better than the 60^{th} percentile.

Criteria 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:

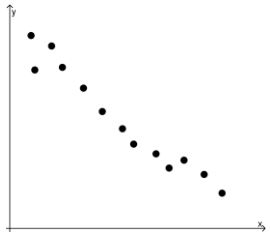
2.2 Qualitative Interpretation of Correlation

QUESTION 32 2.2-MC-A

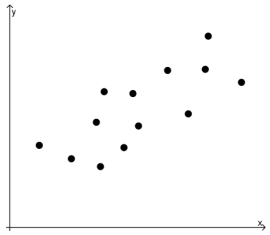
Question:

Which of the following scatterplots shows the strongest linear correlation?

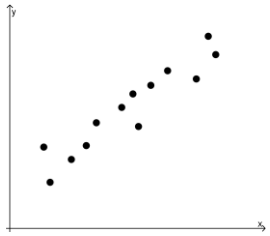
A)



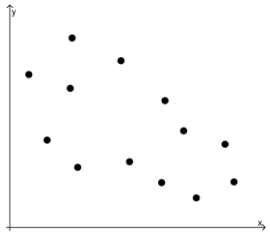
B)



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.

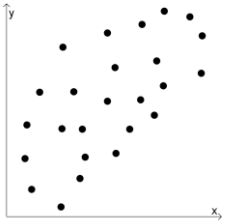
Do not leave a blank!
Make a choice!

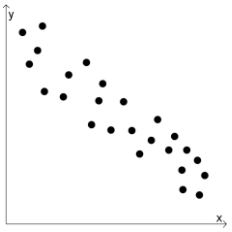
My Strategies:

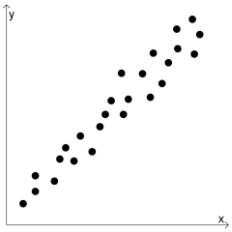
QUESTION 33 2.2-MC-B

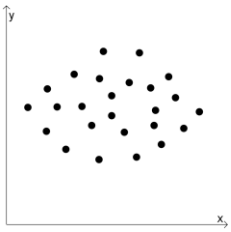
Question:

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 34 2.2-MC-C

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.

AGE (years) \ DISTANCE (m)	[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 35 2.2-SA-A

Question:

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

y / *x*	[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

☐ Weak

☐ Strong

Direction

☐ Positive

☐ 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:

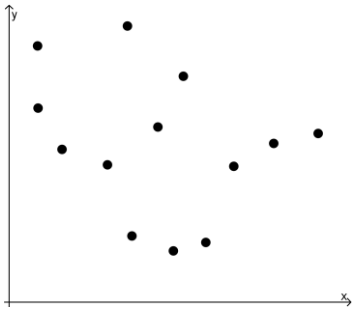
QUESTION 36 2.2-SA-B

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 37 2.3-MC-A

Question:

The table below shows the linear correlation coefficient between the two variables of four different statistical distributions.

Distribution	Linear Correlation Coefficient
1	–0.81
2	0.39
3	–0.27
4	0.74

Which of the following presents these distributions, in order, from weakest to strongest linear correlation?

A) 1, 4, 2, 3

B) 3, 2, 4, 1

C) 1, 3, 2, 4

D) 4, 2, 3, 1

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 38 2.3-MC-B

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 39 2.3-MC-C

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.

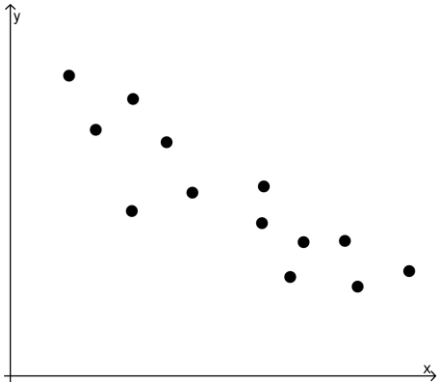
Do not leave a blank! Make a choice!

My Strategies:

QUESTION 40 2.3-SA-A

Question:

Consider the following scatterplot.



What is the linear correlation coefficient?

The linear correlation coefficient 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.

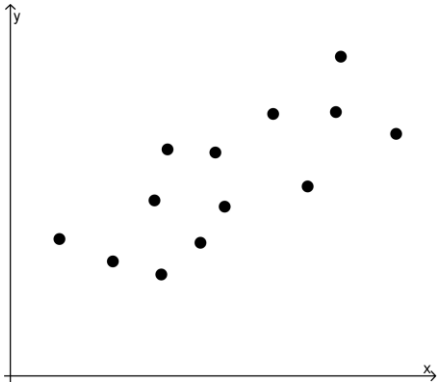
Do not leave a blank!

My Strategies:

QUESTION 41 2.3-SA-B

Question:

Consider the following scatterplot.



Estimate the linear correlation coefficient.

The linear correlation coefficient 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 42 2.3-AQ

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:

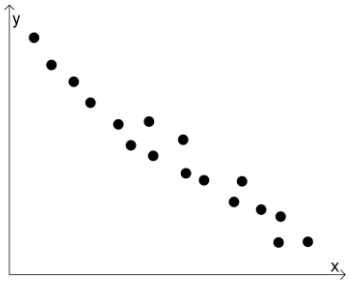
2.4 Interpretation of Linear Correlation

QUESTION 43 2.4-MC-A

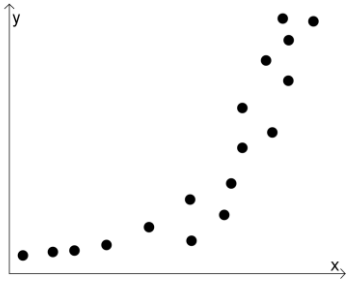
Question:

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

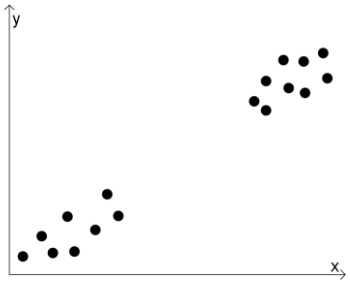
A)



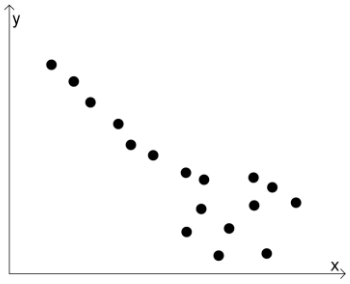
B)



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!

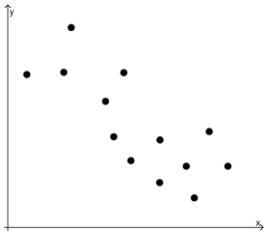
My Strategies:

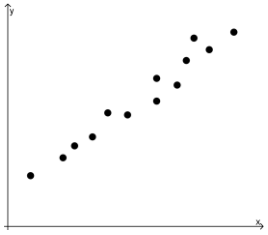
QUESTION 44 2.4-MC-B

Question:

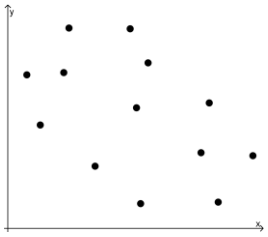
Four different relationships between two variables are shown in the graphs below.

Which relationship would allow you to make the most accurate prediction?

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 45 2.4-MC-C

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 46 2.4-MC-D

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.

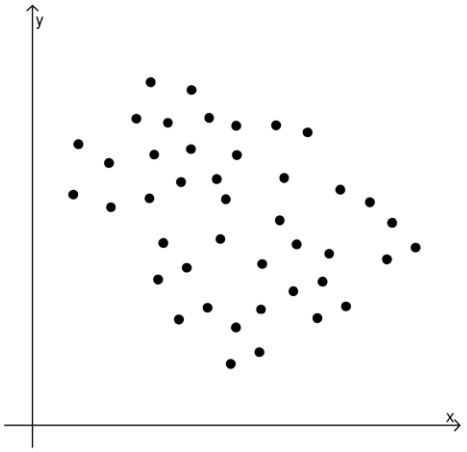
Do not leave a blank! Make a choice!

My Strategies:

QUESTION 47 2.4-MC-E

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.

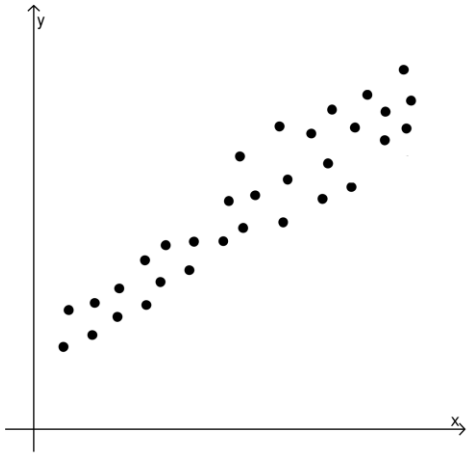
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 48 2.4-MC-F

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 49 2.4-AQ

Question:

A class of secondary 4 students measured their foot lengths and their heights. The results are represented in the table below.

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 was absent was absent the day data was collected. School records show that 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!

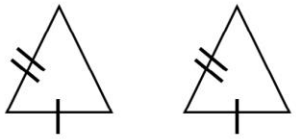
My Strategies:

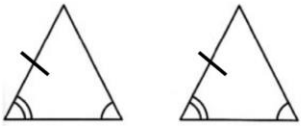
3.1 Congruent Triangles

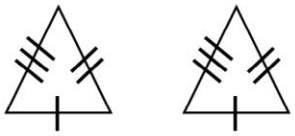
QUESTION 50 3.1-MC-A

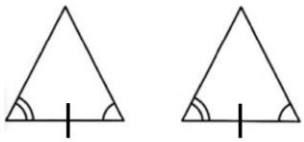
Question:

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.

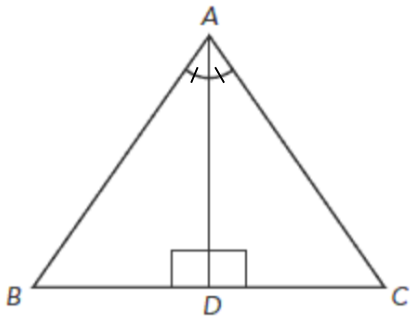
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 51 3.1-MC-B

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) AA

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.

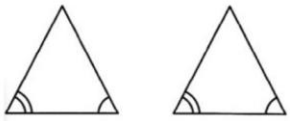
Do not leave a blank!
Make a choice!

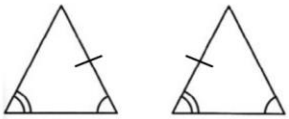
My Strategies:

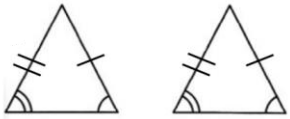
QUESTION 52 3.1-MC-C

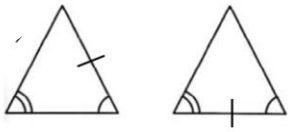
Question

Which of the following pairs of triangles is 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.

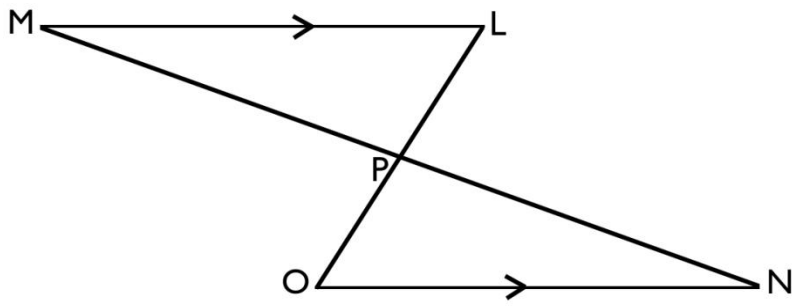
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 53 3.1-SA-A

Question:

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



Show that triangles ΔLMP and ΔONP are congruent. Remember to justify each of your statements.

_____ ≅ _____

_____ ≅ _____

_____ ≅ _____

ΔLMP ≅ ΔONP 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.

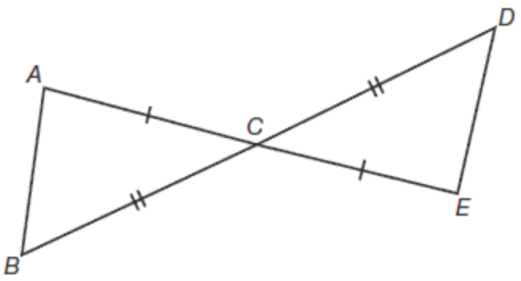
Do not leave a blank!

My Strategies:

QUESTION 54 3.1-SA-B

Question:

Consider the following diagram.



Show 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.

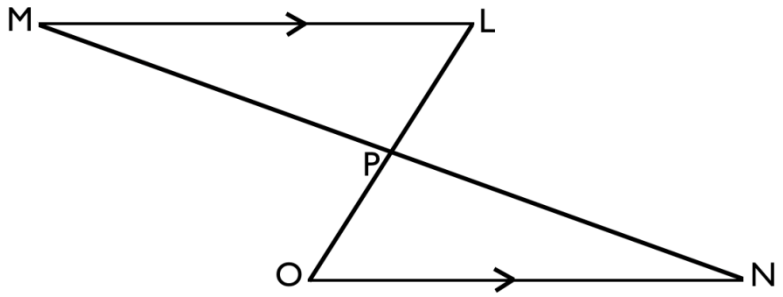
Do not leave a blank!

My Strategies:

QUESTION 55 3.1-AQ

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 metres

You charge \$5 per m^2 for doing the painting (round your measurements to the nearest m^2).

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!

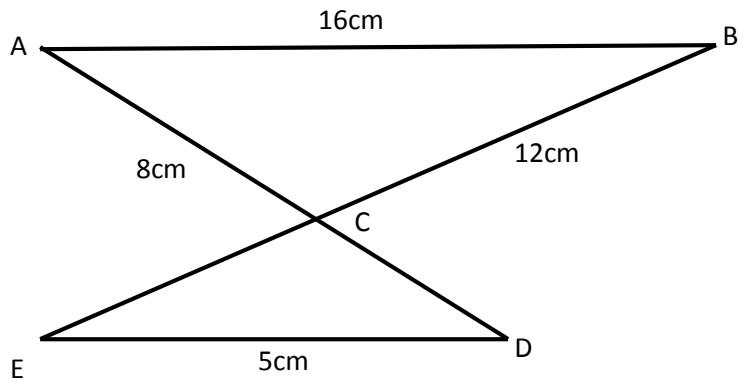
My Strategies:

3.2 Similar Triangles

QUESTION 56 3.2-MC-A

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?

E) 2.5 cm

F) 3.75 cm

G) 14.5 cm

H) 15.75 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 without looking at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

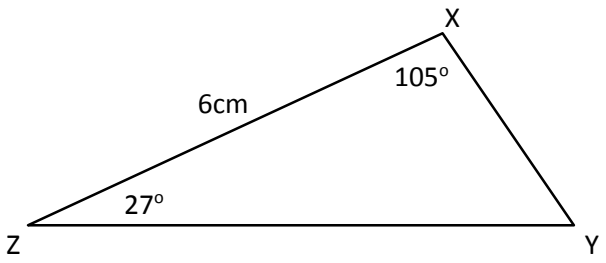
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 57 3.2-MC-B

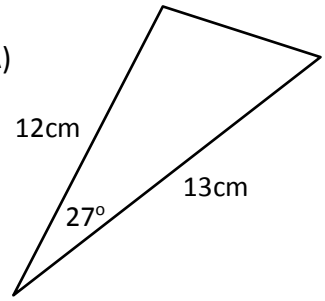
Question:

Triangle XYZ is shown below.

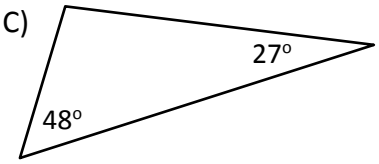


Which of the triangles below is necessarily similar to triangle XYZ?

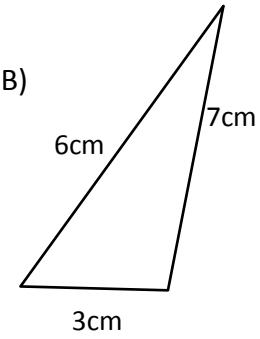
A)



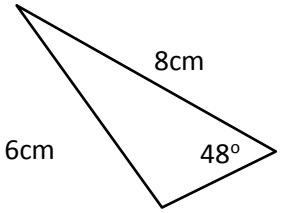
C)



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 58 3.2-MC-C

Question:

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

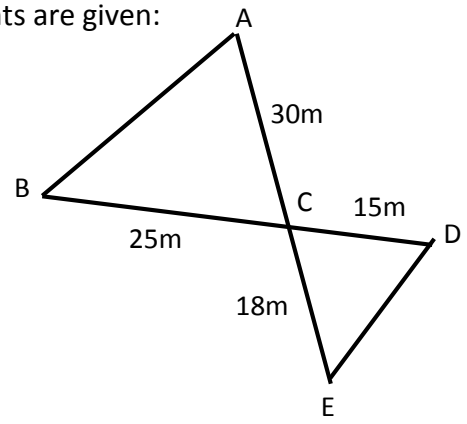
Other measurements are given:

$m\overline{AC} = 30m$

$m\overline{BC} = 25m$

$m\overline{CD} = 15m$

$m\overline{CE} = 18m$



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

A) Two triangles are similar if they have two congruent corresponding angles. (AA)

B) Two triangles are similar if they have corresponding sides that are proportional. (SSS)

C) Two triangles are similar if they have corresponding proportional contained between two congruent angles. (ASA)

D) Two triangles are similar if they have a congruent angle contained between the corresponding sides that are proportional. (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!

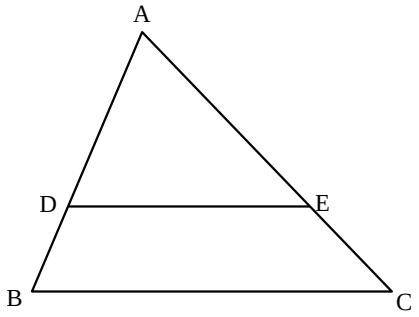
My Strategies:

QUESTION 59 3.2-SA-A

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.



What is the length of segment EC?

The length of segment EC is _____ m.

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.

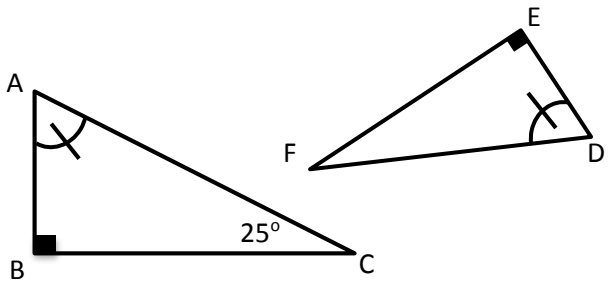
Do not leave a blank!

My Strategies:

QUESTION 60 3.2-SA-B

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 _____.

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!

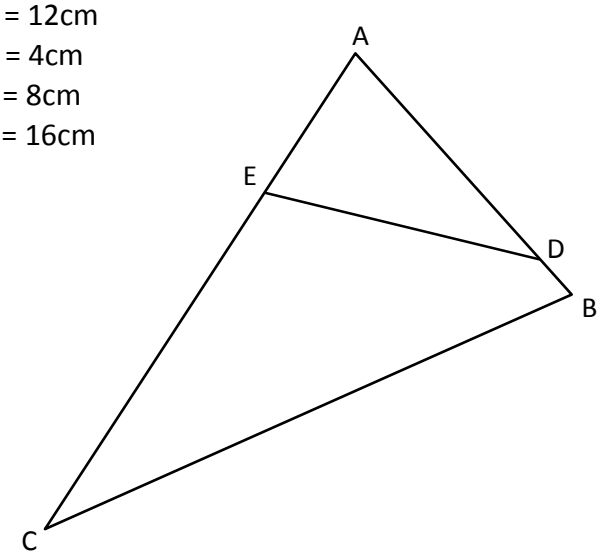
My Strategies:

QUESTION 61 3.2-AQ

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 $\Delta ABC \; is \; similar \; to \; \Delta AE$

☐ 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:

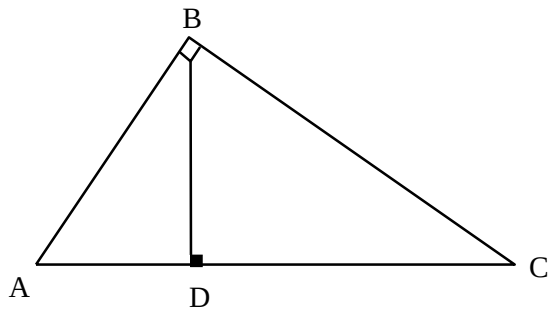
3.3 Metric Relations (Right Triangles)

QUESTION 62 3.3-MC-A

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

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!

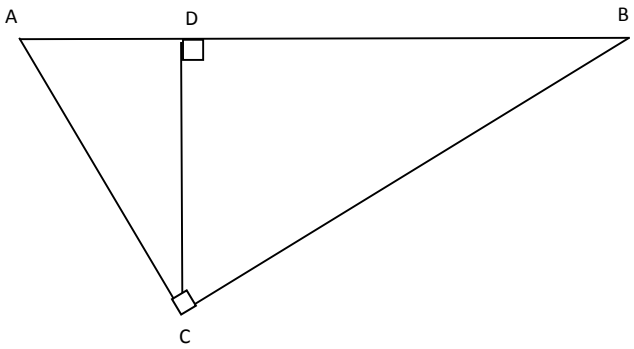
My Strategies:

QUESTION 63 3.3-MC-B

Question:

Triangle ABC has the following properties:

- m$\angle$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 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!

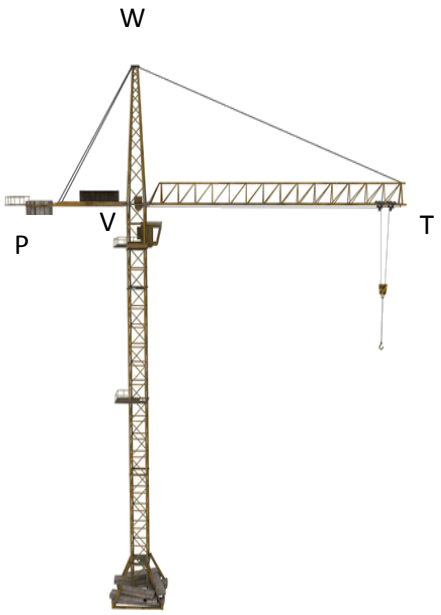
My Strategies:

QUESTION 64 3.3-SA-A

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 _____.

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!

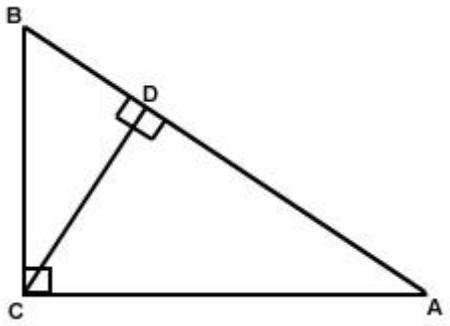
My Strategies:

QUESTION 65 3.3-SA-B

Question:

Triangle ABC has the following properties:

- m$\angle$ 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.

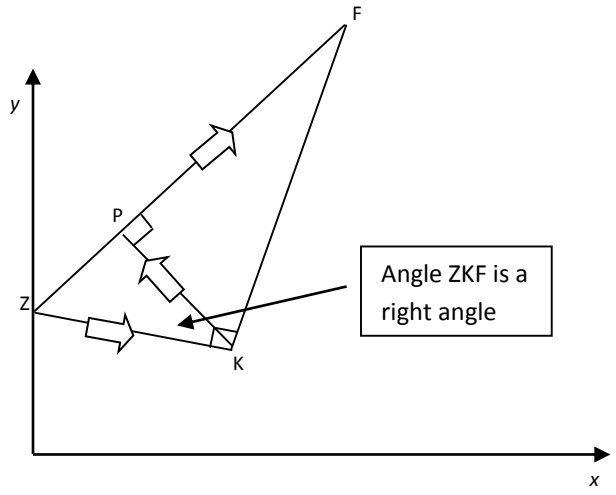
Do not leave a blank!

My Strategies:

QUESTION 66 3.3-AQ-A

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.



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

What is the total combined distance of all three passes?

The total combined distance is _____ m.

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:

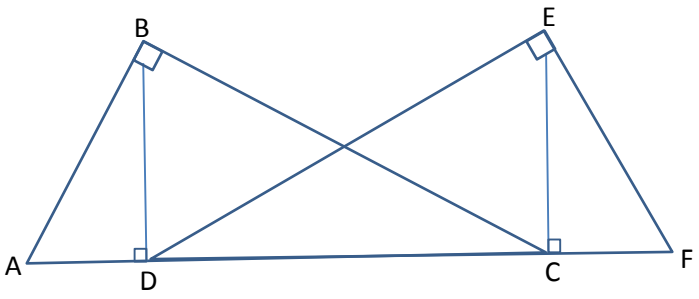
QUESTION 67 3.3-AQ-B

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 metres in height and one of the support cables (AB) measures 110 metres.

Also, m$\angle$ABC and m$\angle$DEF are both 90° and the towers are perpendicular to the base of the bridge.



Show that the length of the cable represented by segment DE measures 240 m.

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:

4.1 Real Functions

QUESTION 68 4.1-MC-A

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 69 4.1-MC-B

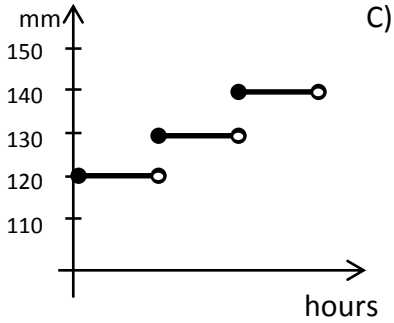
Question:

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.

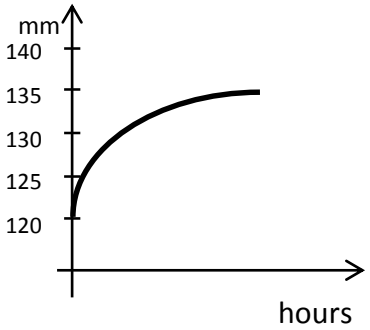
The graphs below relate the number of hours since the storm began with the accumulated rainfall in mm.

Which graph below correctly illustrates the relationship?

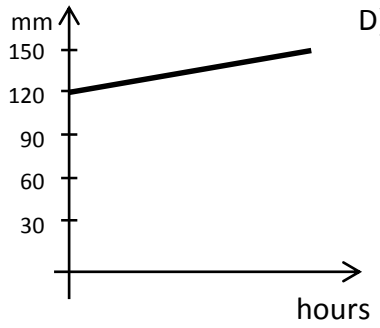
A)



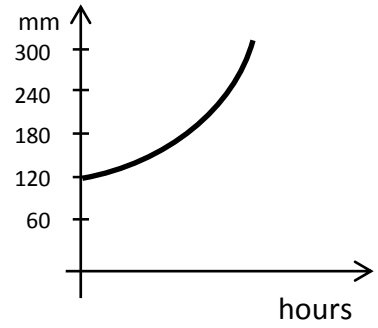
C)



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.

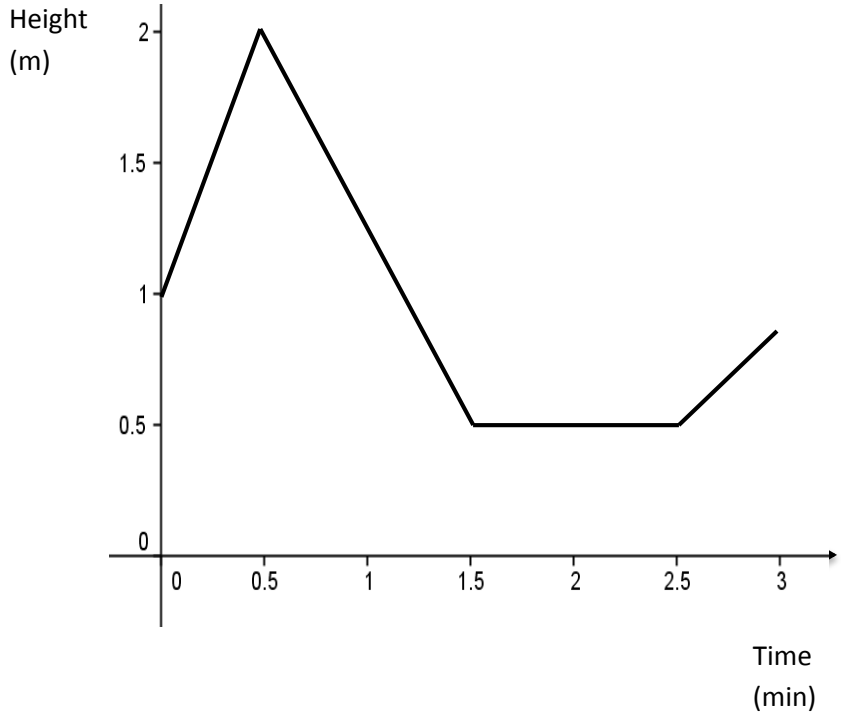
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 70 4.1-MC-C

Question:

The height of a toy hovercraft in relation to the time elapsed since its launch from a table is represented by a piecewise function for the first three minutes of his flight as shown on the graph below.



Which of the following statements is TRUE?

A) The function has no zeros

B) The domain of the function is [0.5, 2].

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

D) The function has no extrema.

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.

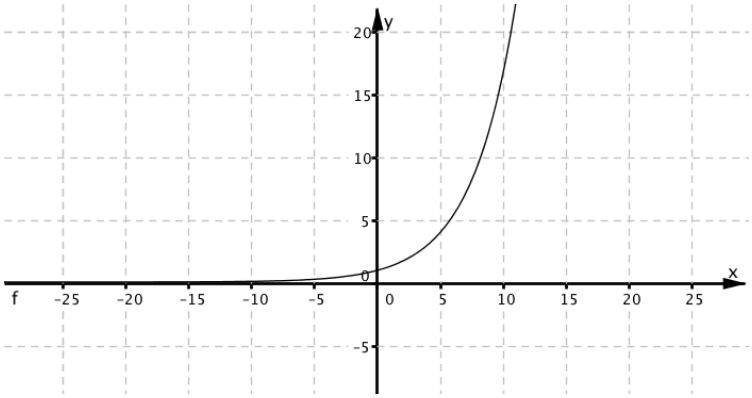
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 71 4.1-SA-A

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.

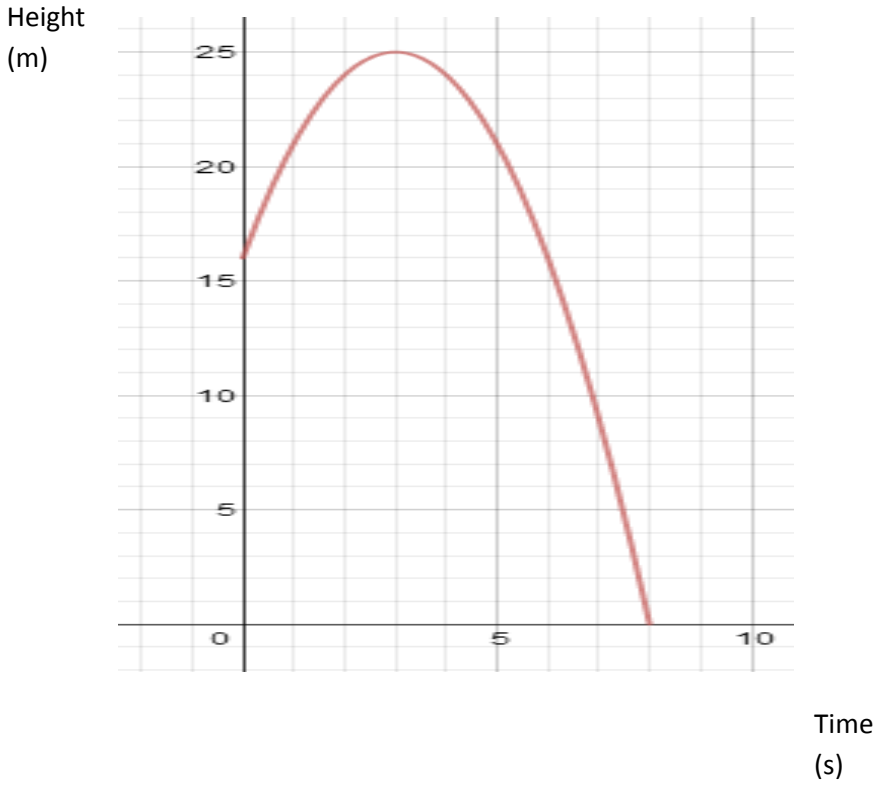
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 72 4.1-SA-B

Question:

A ball is thrown from a cliff and follows a parabolic trajectory.
The function shown below represents the height of the ball according to the time elapsed since it is thrown.



What is the range of the function and what does it mean in concrete terms?

The range of the function is _____. It means _____

_____

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.

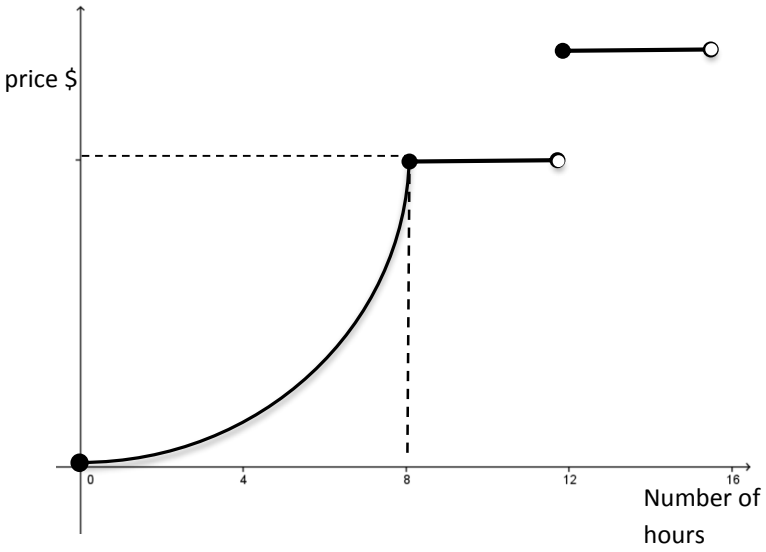
Do not leave a blank!

My Strategies:

Question:

A 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.



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

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

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 74 4.2-MC-A

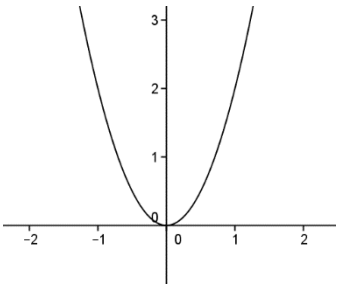
Question:

Consider the following function:

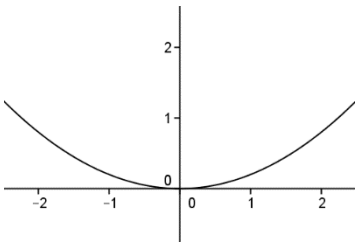
$$f(x) = 2x^2$$

Which of the following graphs represents the function?

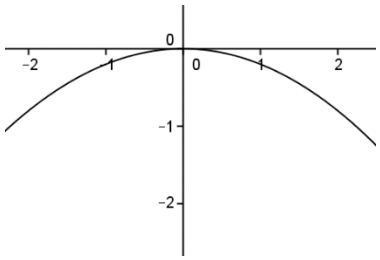
A)



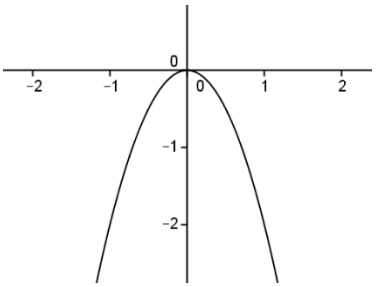
B)



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.

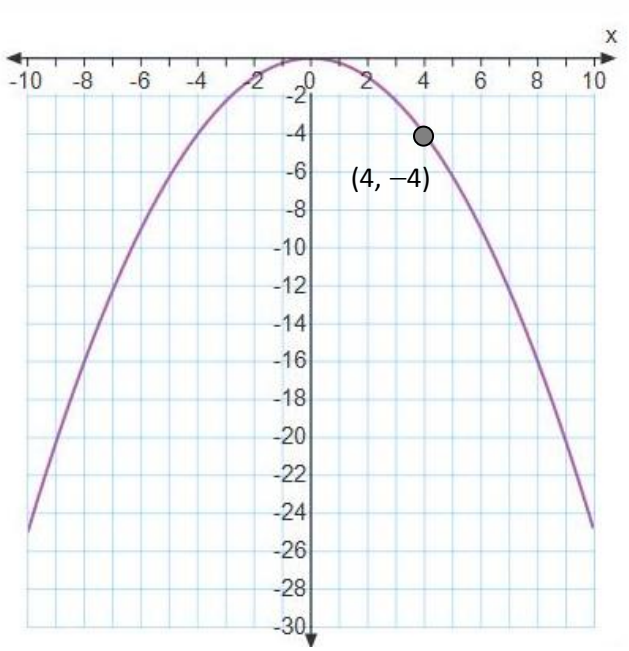
Do not leave a blank! Make a choice!

My Strategies:

QUESTION 75 4.2-MC-B

Question:

Which rule represents the following graph?



A) $y = 0.25x^2$

B) $y = -0.25x^2$

C) $y = -0.25^x$

D) $y = 0.25x\ + 1$

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 76 4.2-MC-C

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!

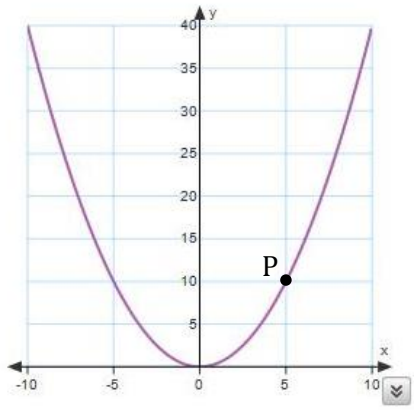
My Strategies:

QUESTION 77 4.2-SA-A

Question:

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

What is the rule of the function?



The rule of the function 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.

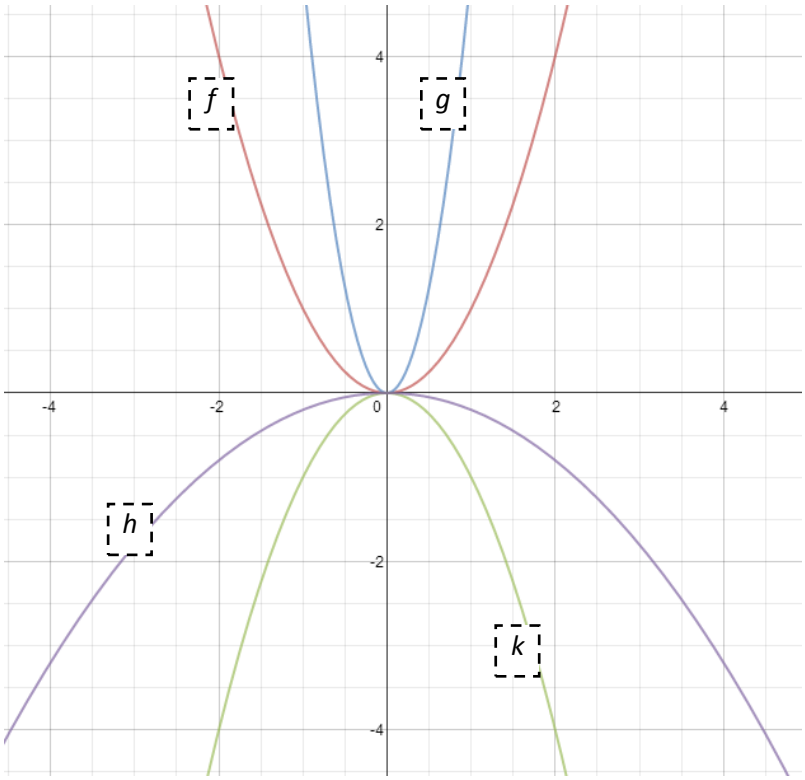
Do not leave a blank!

My Strategies:

QUESTION 78 4.2-SA-B

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) $y = -x^2$	

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:

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:

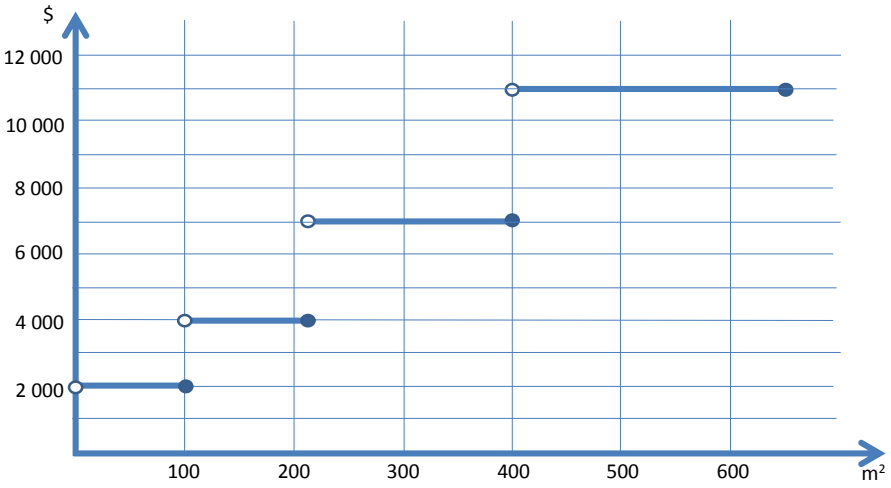
The turf is sold in square pieces and the price is calculated according to its area.

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?

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. Ask yourself whether your answer makes sense.
9. Write your answer statement.

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

My Strategies:

4.3 Exponential Function

QUESTION 80 4.3-MC-A

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 81 4.3-MC-B

Question:

Cheryl bought a bike in 2010. Since then, the value off the bike has decreased.

Function *f* described below represents the value of Cheryl's bike.

$$f(x) = 505\ (0.94)^x$$

where x : time elapsed, in years, since Cheryl bought the bike
$f(x)$: the value of the bike, in dollars

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 graph of the function of the line is linear,

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 82 4.3-SA-A

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?

The initial price of video game 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 83 4.3-SA-B

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?

In _____ the number of bacteria will 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:

QUESTION 84 4.3-SA-C

Question:

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

How much profit will she have made in 10 years?

Sophia will have made _____ profit 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:

QUESTION 85 4.3-SA-D

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?

_____ will have more money 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:

QUESTION 86 4.3-AQ

Question:

A study examined the populations of four neighboring towns.

Town A
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.

Town B
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

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

Town D
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:

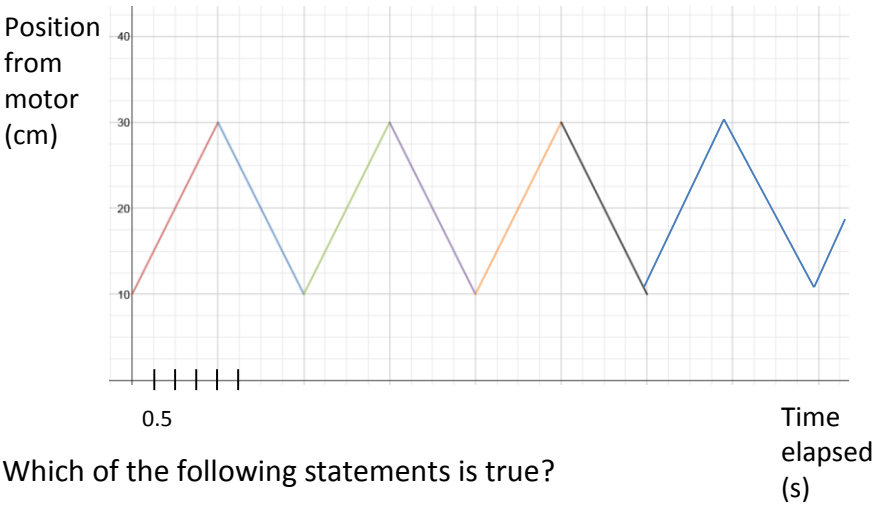
4.4 Step, Periodic and Piecewise Functions

QUESTION 87 4.4-MC-A

Question:

Every day, a paddle pushes water to create the waves in a wave pool.

The periodic function represented below can be used to determine the position of the paddle from the motor in relation to the time elapsed from the moment the motor is turned on at the beginning of the day.



Which of the following statements is true?

A) $f(22) = 10$

B) The period of this function is 4.

C) The range of this function is $[0, +\infty[$.

D) Over the interval [6, 8], this function is 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. 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.

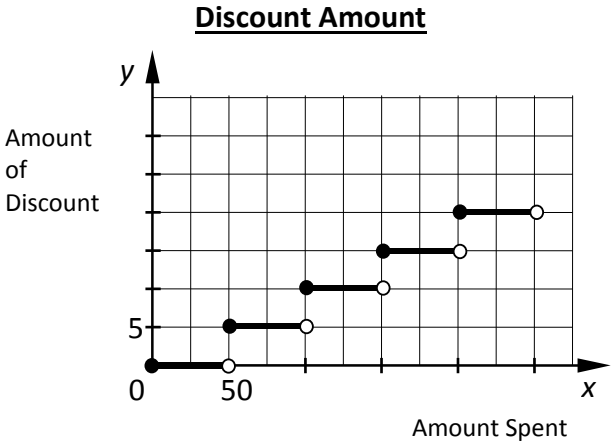
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 88 4.4-MC-B

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.



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 89 4.4-SA-B

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.

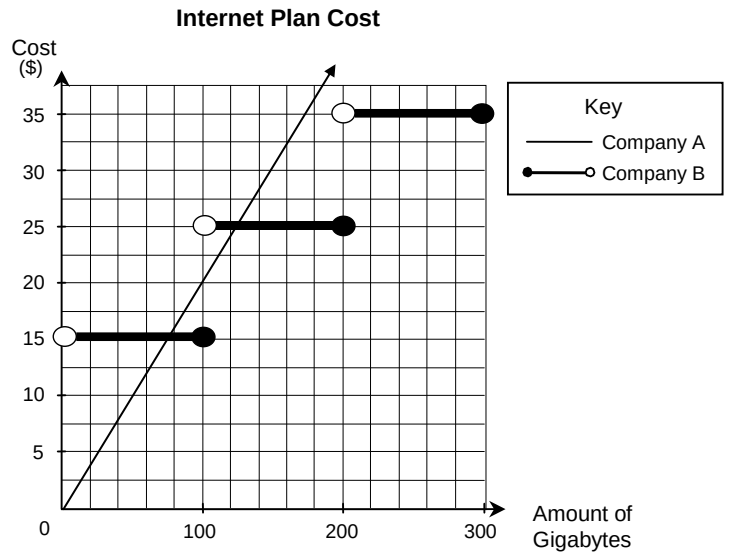
Do not leave a blank!

My Strategies:

QUESTION 90 4.4-SA-C

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.



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:

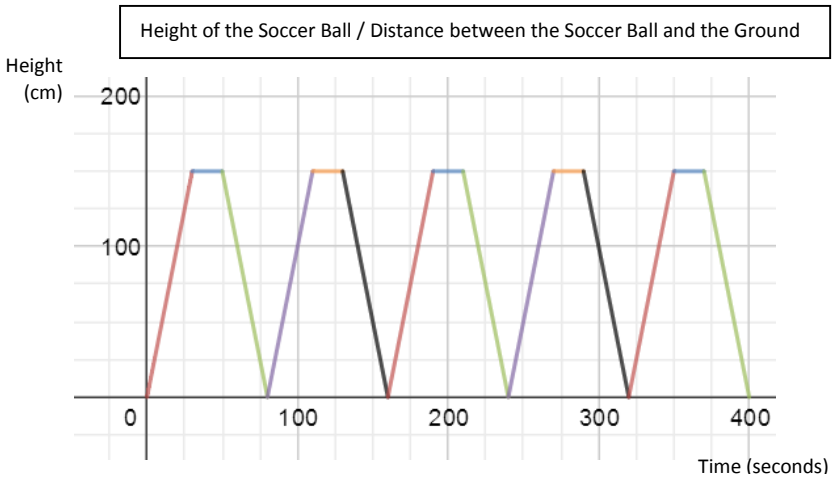
QUESTION 91 4.4-AQ-A

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.



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!

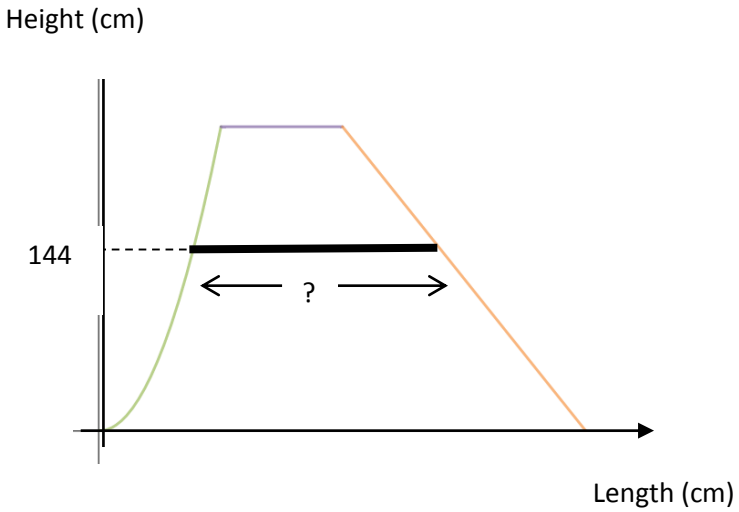
My Strategies:

QUESTION 92 4.4-AQ-B

Question:

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

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



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!

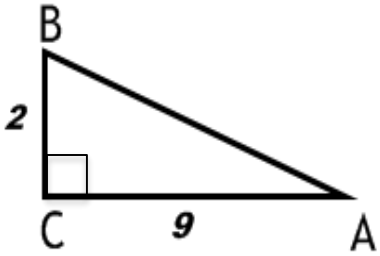
My Strategies:

5.1 Trigonometric Ratios

QUESTION 93 5.1-MC-A

Question:

Consider the right triangle ABC shown below.



Which of the following expressions represents the correct trigonometric ratio for angle A?

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

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

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

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

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 without looking at choices shown (A, B, C and D).
7. Look at all the choices.
8. Match your answer to the appropriate choice.

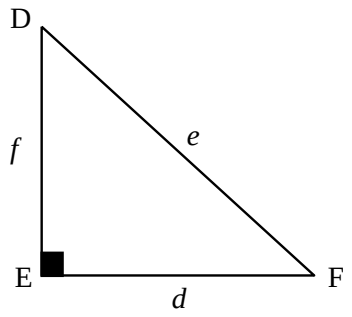
Do not leave a blank! Make a choice!

My Strategies:

QUESTION 94 5.1-MC-B

Question:

Consider right triangle DEF shown below.



Which trigonometric ratio corresponds to the ratio $\frac{d}{e}$?

A) cos D

B) tan D

C) cos F

D) sin F

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.

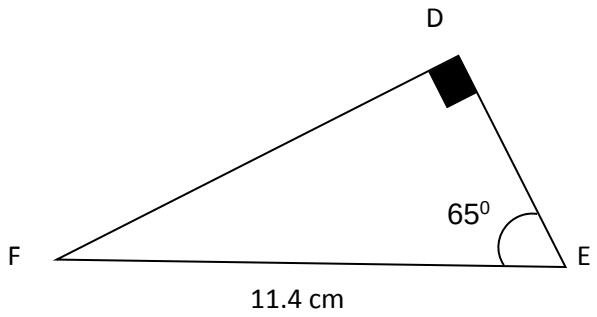
Do not leave a blank! Make a choice!

My Strategies:

QUESTION 95 5.1-MC-C

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 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!

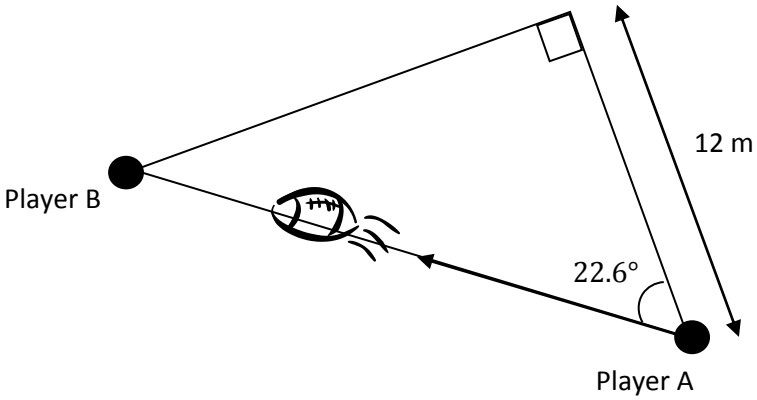
My Strategies:

QUESTION 96 5.1-SA-A

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?



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

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.

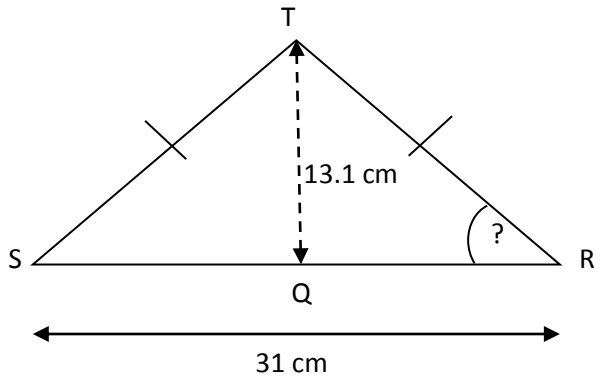
Do not leave a blank!

My Strategies:

QUESTION 97 5.1-SA-B

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 _____.

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 98 5.1-AQ

Question:

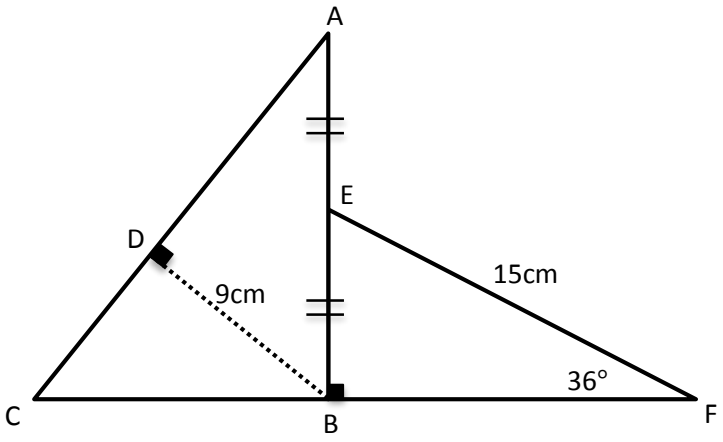
In the figure below, triangle BEF and triangle ABC are right triangles.

In addition,

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

The drawing is not to scale.

What is the area of figure AEFC?



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!

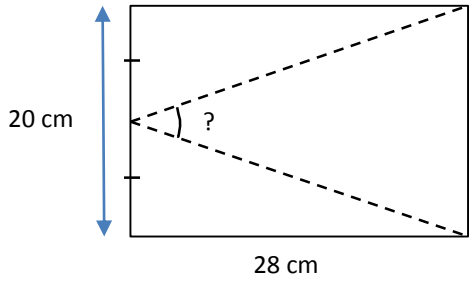
My Strategies:

5.2 Finding Missing Measurements

QUESTION 99 5.2-MC-A

Question:

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



What is the angle formed between the two dashed lines?

A) 19.7°

B) 39.4°

C) 70.3°

D) 140.6°

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!

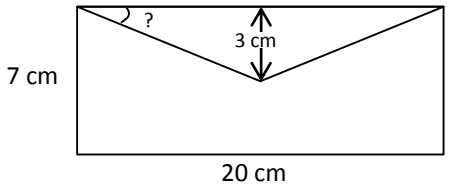
My Strategies:

QUESTION 100 5.2-MC-B

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?



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 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!

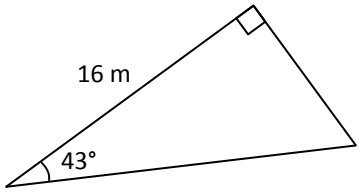
My Strategies:

QUESTION 101 5.2-MC-C

Question:

Sylvain wants to paint the surface of his triangular deck.

What is the area to be painted?



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 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:

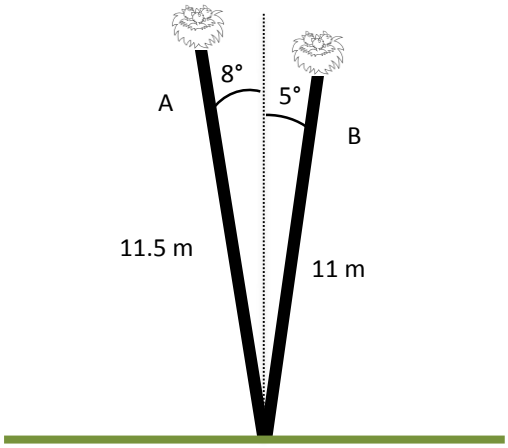
QUESTION 102 5.2-SA-A

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?

Round your answer to the nearest hundredth.



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

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!

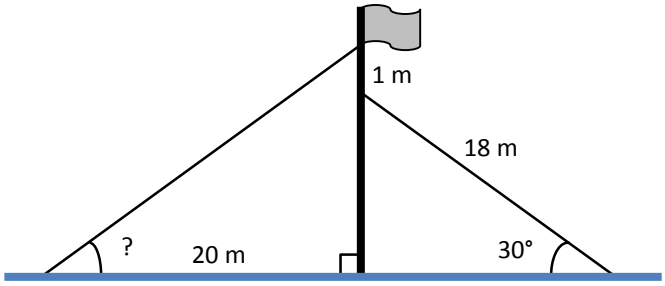
My Strategies:

QUESTION 103 5.2-SA-B

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 1 m below the point where the left guy wire is attached to the pole. The left guy wire is located 20 m 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!

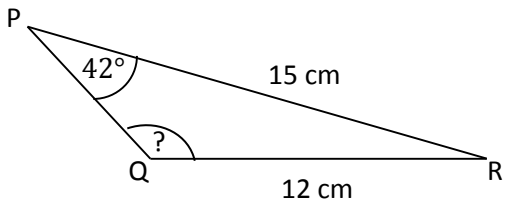
My Strategies:

QUESTION 104 5.2-SA-C

Question:

In triangle PQR, we have $m\angle P = 42°;\ m\overline{PR} = 15\ cm;\ m\overline{QR} = 12\ c$

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



To the nearest degree, what is the measure of $\angle PQR$?

The measure of $\angle PQR$ 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!

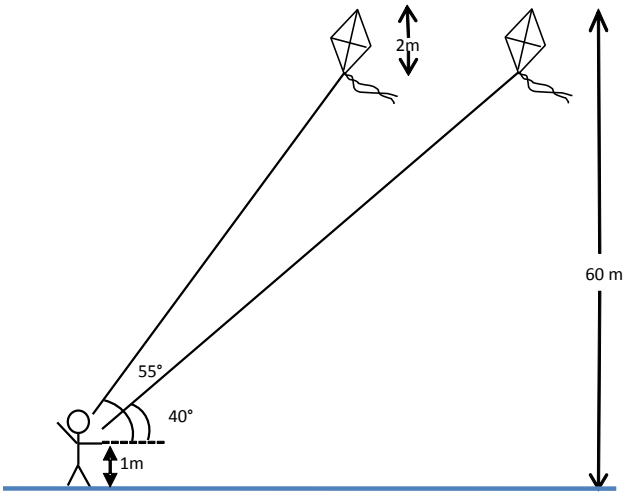
My Strategies:

QUESTION 105 5.2-AQ

Question:

Sally is flying a kite. The tip of the kite is 60 m above the ground and the kite itself is 2 m 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 decreased 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.

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, make an educated guess 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!

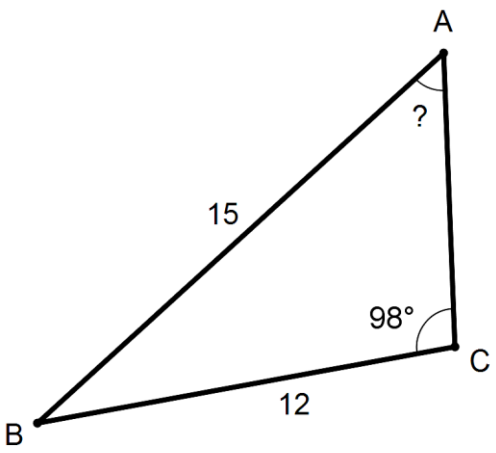
My Strategies:

5.3 Calculating the Area of any Triangle

QUESTION 106 5.3-MC-A

Question:

Consider the following diagram of triangle ABC.



What is the measure of angle CAB?

A) $53.1°$

B) $52.4°$

C) $38.7°$

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.

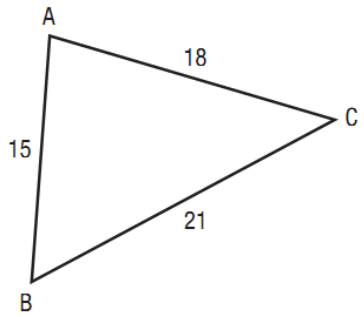
Do not leave a blank!
Make a choice!

My Strategies:

QUESTION 107 5.3-MC-B

Question:

Consider the following diagram of triangle ABC. All measurements are in metres.



What is the area of triangle ABC?

A) $7.35\ \text{m}^2$

B) $25.5\ \text{m}^2$

C) $132.3\ \text{m}^2$

D) $187.1\ \text{m}^2$

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 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!

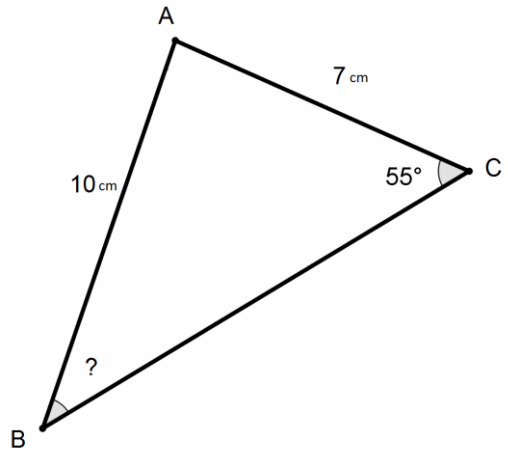
My Strategies:

QUESTION 108 5.3-SA-A

Question:

Consider triangle ABC shown below.

To the nearest degree, what is the measure of angle AB?



The measure of angle ABC 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.

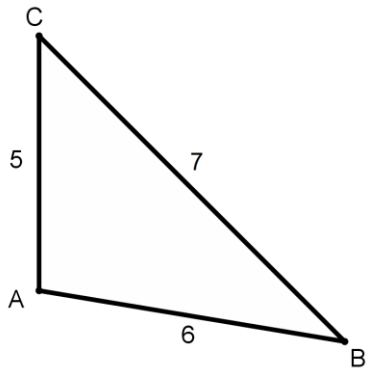
Do not leave a blank!

My Strategies:

QUESTION 109 5.3-SA-B

Question:

What is the area of triangle ABC shown below?
All measurements are in cm.



The area of triangle ABC 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.

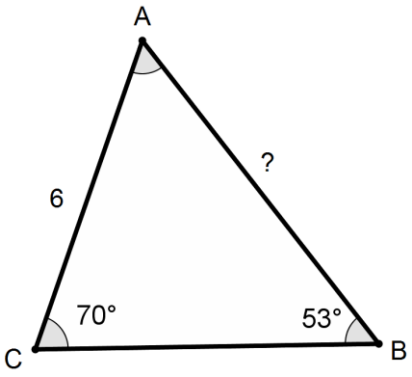
Do not leave a blank!

My Strategies:

QUESTION 110 5.3-SA-C

Question:

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



The length of segment AB is _____ .

General Strategies:

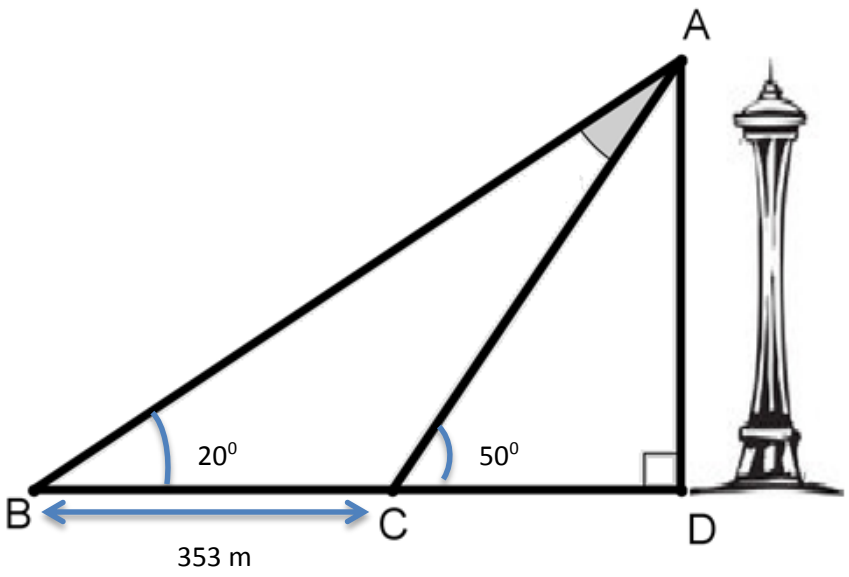
1. Read the question.
2. Highlight key words.
3. Identify the math topic.
4. Re-read the question.
5. Make a prediction about the answer- what will it look like? (an equation, a number, etc.).
6. Refer to your memory aid, as needed.
7. Solve.
8. Ask yourself whether your answer makes sense.
9. Write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

Do not leave a blank!

My Strategies:

Question:

The 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.



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:

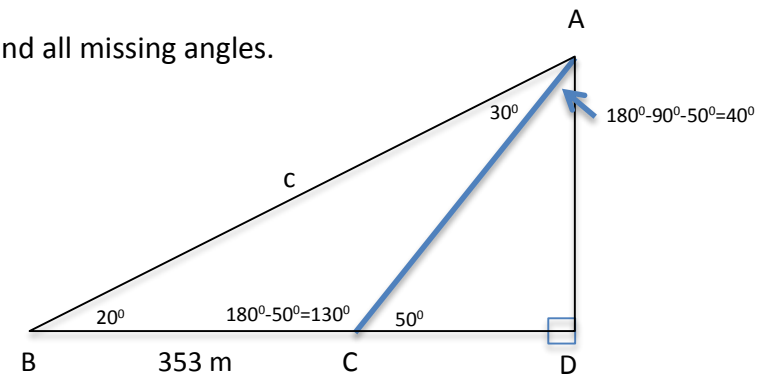
1. Read the problem.
2. Highlight key words.
3. Identify the math topics.
4. Re-read the problem.
5. Define your steps (your game plan) – this is criteria 3.
6. Refer to your memory aid, as needed.
7. Solve.
8. If you get stuck on a calculation, pick a number and keep going.
9. Ask yourself whether your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

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

My Strategies:

Answer and Solution:

Find all missing angles.



Apply Sine law to find c.

$$\frac{a}{sinA} = \frac{c}{sinC}$$

$$\frac{353}{sin30} = \frac{c}{sin130}$$

$$c = 541\ m$$

Apply trig to find $\overline{AD}$ (height of Space Needle).

$$sin20 = \frac{\overline{AD}}{541}$$

$$\overline{AD} = 185\ m$$

✓ Yes, his estimation is correct.
☐ No, his estimation is not correct.

Reason: The clinometer measures yield a height of 185 m for the Space Needle. This falls within Phil's estimation of 182 m to 188 m.

Specific Strategies:

1. Find all the missing angles you can
2. Notice triangle ABD is a right angle triangle composed of two other triangles
3. Triangle ABC is not a right angle triangle. So, apply Sine law
4. Triangle ACD is a right angle triangle. So, apply SOH, CAH TOA

Additional Resources:

Visions Volume 2, Section 5.3, p. 103 (Activity 1: Sine Law)
Khan Academy video: https://www.khanacademy.org/math/trigonometry/less-basic-trigonometry/law-sines-cosines/v/law-of-sines Law of Sines