

Applied

Grade 9 Assessment of Mathematics

2011

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
on the Student Answer Sheet (2011, Applied).**

Education Quality and
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Please note: The format of
this booklet is different from
that used for the assessment.
The questions themselves
remain the same.

Directions

Make sure you have the following materials:

- Student Answer Sheet
- the Formula Sheet
- a pencil and an eraser
- a ruler
- a scientific or graphing calculator
- some paper for rough work for multiple-choice questions only

The diagrams in this booklet are **not** all drawn to scale.

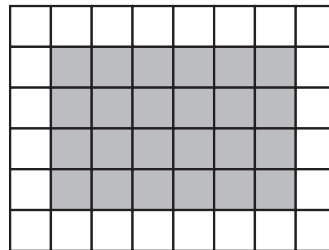
Answering Multiple-Choice Questions


When answering the multiple-choice questions, be sure you use the Student Answer Sheet. The circles you will be filling in are lettered a, b, c, d.

1. Try to answer all of the multiple-choice questions. Do not leave a question blank.
2. Be sure to read each question and its four answer choices carefully. When you choose an answer, fill in the appropriate circle on the Student Answer Sheet. Do not spend too much time on any one question.
3. Mark only one answer for each question. Do not fill in more than one circle for a question.
4. To make a correction, cleanly erase the answer you wish to change and fill in the circle for your new answer.
5. Now do the following sample question. Fill in your choice in the sample row.

Sample Question

- 1** Find the area of the shaded region of the rectangle below.



 1 square unit

- a 16 square units
- b 24 square units
- c 30 square units
- d 36 square units

Sample Row on Answer Sheet

1. a b c d

You should have filled in b.

Answering Open-Response Questions

1. The open-response questions are designed to let you show what you know and what you can do. Try to give clear, well-organized solutions to illustrate your complete understanding and ability to communicate. Give as much information as you can.
2. Do all of your work (even your rough work) in this booklet.
3. Write your solutions so that they can be understood by someone who does not know your work.
4. Make sure you follow the directions on the Key Words page.

For example, a question might ask you to “Show your work.” Read the Key Words page. It says to record all calculations and steps. So, if you sketch a graph in the process of getting to your answer, show the sketch and label it. Use proper and correct mathematical conventions when you present your work.

5. When using a calculator, write down the numbers you use and the operations you carry out.

For example, a question might ask you to “Find the area of a circle with a diameter of 7 cm.” You need to write $A = \pi(3.5)^2$ as well as the answer you get on your calculator.

6. There are many different ways to solve any problem. Use your broad range of mathematical knowledge to present a complete and creative solution to each question.

Key Words

Throughout the assessment, key words are used to identify the type of response required from you. The key words are explained below. Refer to this sheet to make sure you are responding fully to each question.

Compare:

Tell what is the same and what is different.

Describe:

Use words to create a mental picture for the reader.

Determine:

Use mathematics to find a solution to the problem.

List:

Use point form.

Explain:

Use words and symbols to make your solution clear.

Justify:

Give reasons and evidence to show your answer is correct.

Show your work:

Record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.

- 1** The dimensions of a rectangle are in a 3:5 ratio. If the shorter side lengths are 30 cm, what are the lengths of the longer sides?

a 10 cm
 b 15 cm
 c 18 cm
 d 50 cm

- 2** The table below shows information about renting movies from four different stores.

Name of store	Total cost (\$)	Number of movies rented
Great Flix	6	2
Net Show	12	3
Movie Time	25	10
DVDs R Us	36	12

Which store offers the lowest cost per movie?

a Great Flix
 b Net Show
 c Movie Time
 d DVDs R US

- 3** The table below shows the price per case of water at different stores.

Store	Price per case	Number of 500 mL bottles per case
Cheapies	\$1.75	8
Foodsmart	\$2.25	12
Variety Foods	\$4.59	20
Super Grocers	\$4.99	24

Evelyn is buying 120 bottles of water.

At which store should Evelyn buy her water to pay the least?

a Cheapies
 b Foodsmart
 c Variety Foods
 d Super Grocers

- 4** The cost of an MP3 player is \$299. A newer model costs 20% more.

Which of the following is closest to the sale price of the newer model after a 30% discount?

a \$251.16
 b \$269.10
 c \$289.00
 d \$310.96

5 What is the value of the expression $\frac{-12}{-6 + 3}$?

- a $\frac{1}{4}$
- b $\frac{4}{3}$
- c 4
- d 5

6 Which value of x makes the equation $1 + \sqrt{x} = 10$ true?

- a 3
- b 9
- c 18
- d 81

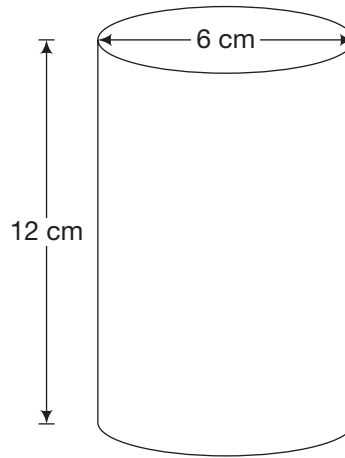
7 The equation $d = 3.6 \times \sqrt{h}$ represents the relationship between the distance, d , that a person can see in an open field, in kilometres, and the person's height, h , in metres.

One afternoon, Amy can see a distance of 4.5 km.

Which of the following is closest to Amy's height?

- a 1.1 m
- b 1.6 m
- c 2.1 m
- d 2.5 m

8 A candle made of wax is in the shape of a cylinder.



Hint:
 $V = \pi r^2 h$

Which is closest to the total amount of wax to make the candle?

- a 226 cm^3
- b 339 cm^3
- c 452 cm^3
- d 1357 cm^3

9 Which expression is a simplified form of

$$-2x(-4x + 3)?$$

- a $8x^2 - 6x$
- b $8x^2 + 6x$
- c $-8x^2 - 3$
- d $-8x^2 + 3$

10 Guzzling Gas

David and Shaunese each take a 450 km trip.

- David drives a car and uses 7 L of gas per 100 km.
- Shaunese drives a truck and uses 12 L of gas per 100 km.

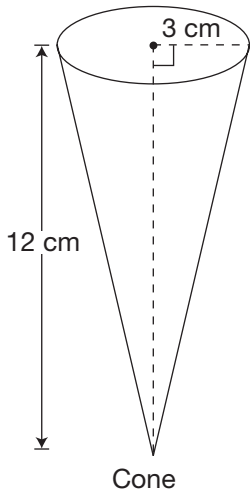
If gas costs \$0.90/L, how much more will it cost Shaunese than David to drive 450 km?

Show your work.



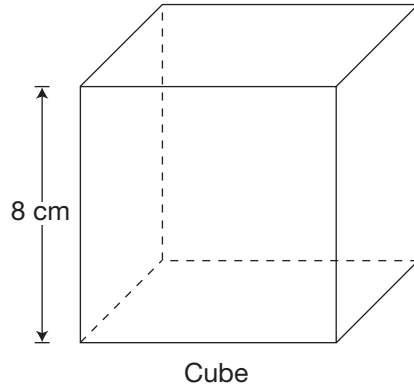
11 Juggling Juice

Juice is sold in two different containers, a cone and a cube, as shown below.



Cone

$$\text{Volume} = \frac{\pi r^2 h}{3}$$



Cube

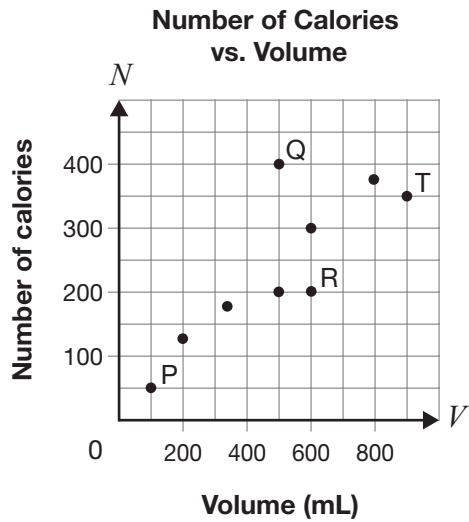
$$\text{Volume} = l^3$$

Which container holds more juice?

Circle one: Cone Cube

Show your work.

- 12** The graph below represents the relationship between the number of calories and the volume for various drinks.



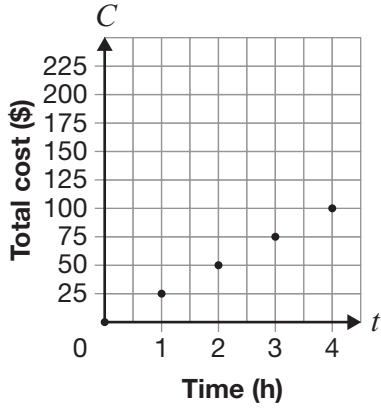
Which of the following points represents a drink with more calories than expected for its volume?

- a P
- b Q
- c R
- d T

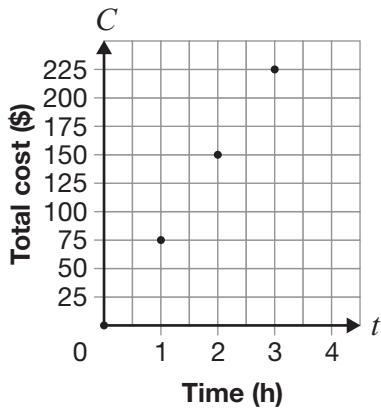


13 A plumber charges an initial fee of \$50, plus an additional \$25 per hour.
Which graph represents this relationship?

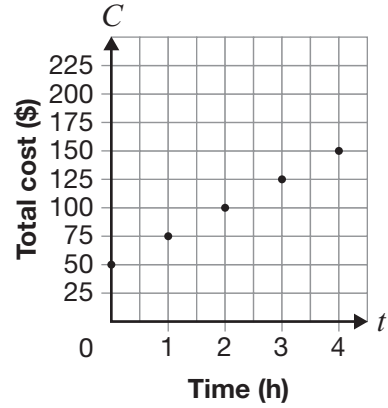
a Total Cost vs. Time



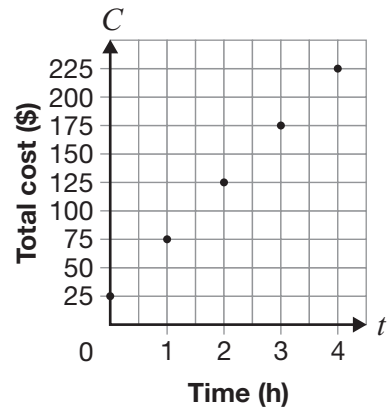
b Total Cost vs. Time



c Total Cost vs. Time



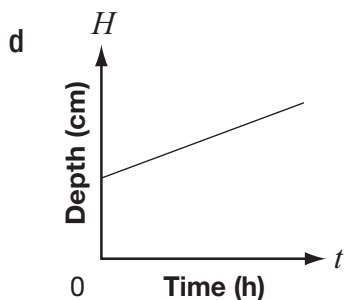
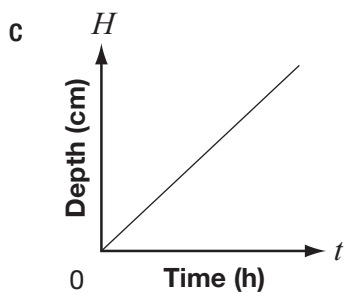
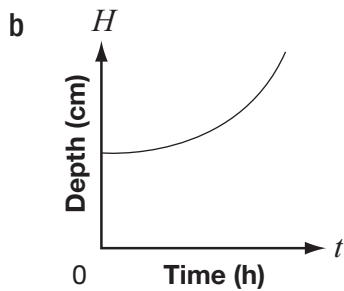
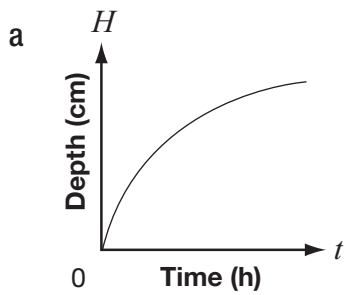
d Total Cost vs. Time



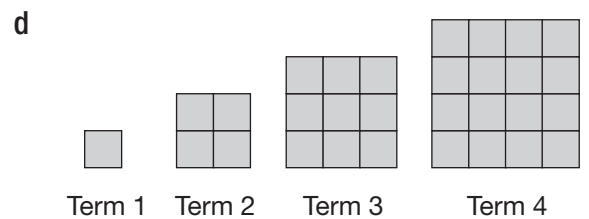
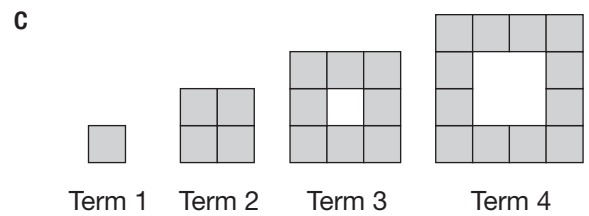
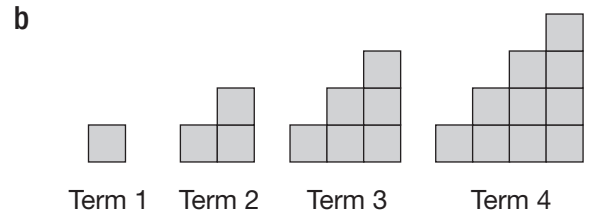
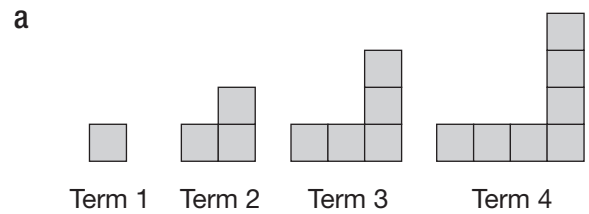
- 14** A snowstorm lasts for seven hours. Data is recorded for the depth of snow for the first five hours.

Time (h)	Depth of snow (cm)
0	5
1	8
2	11
3	14
4	17
5	20

Which graph below best models the depth of snow during the five hours?



- 15** In which of the following patterns is there a linear relationship between the number of shaded squares and the term number?



- 16** An online music store provides music that members can download. The store charges a membership fee and a cost per song.

The chart below represents the relationship between the total cost and the number of songs downloaded.

Number of songs	Total cost (\$)
10	13
20	16
30	19

Which of the following is **not** true about this relationship?

- a It is non-linear.
 - b It has an initial cost.
 - c It has a constant rate of change.
 - d It can be represented by a straight line.
- 17** At her fitness club, Joanne is charged \$15 per month. The total cost for 12 months is \$270.
- Is the relationship between the total cost and the number of months a direct or a partial variation, and what is the initial fee?
- a direct variation, \$0
 - b direct variation, \$180
 - c partial variation, \$15
 - d partial variation, \$90

- 18** The total cost for printing a classified advertisement in a local newspaper is made up of a \$30 fee, plus \$0.10 per word.

Which equation below models the relationship where C is the total cost to place the advertisement and w is the number of words?

- a $C = 10 + 0.30w$
 - b $C = 10 + 30w$
 - c $C = 30 + 10w$
 - d $C = 30 + 0.10w$
- 19** Pablo has a cellphone. The relationship between his total monthly cost, C , in dollars, and the number of minutes he uses the phone, t , is represented by the equation $C = 20 + 0.25t$.
- Which of the following is **not** true about this relationship?
- a The cost per minute is \$0.25.
 - b The value of the rate of change is 0.25.
 - c The total monthly cost for 1 minute is \$20.
 - d The graph of the relationship has a C -intercept of 20.

- 20** The equation $C = 15n + 100$ represents the relationship between the total cost of a gym membership, C , in dollars, and the number of months of membership, n .

Which statement about this gym membership is true?

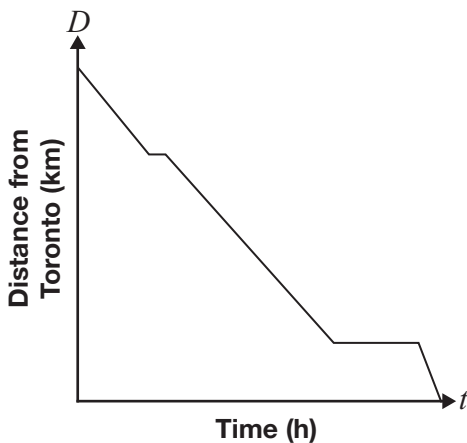
- a It has an initial cost of \$15.
- b It costs \$115 per month.
- c It has an initial cost of \$15 and a fee of \$100 per month.
- d It has an initial cost of \$100 and a fee of \$15 per month.

21 The following describes Ihab's drive from Windsor to Toronto:

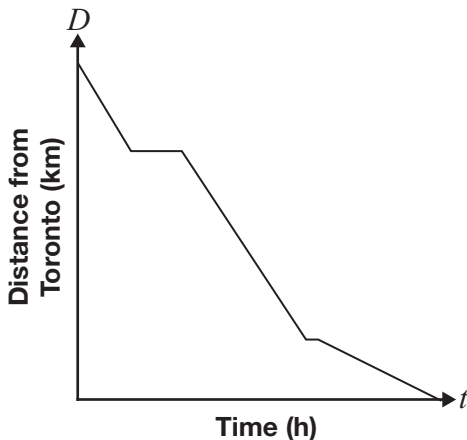
- One hour after leaving Windsor, he stops for 15 minutes to have a snack.
- He then drives for two more hours and then stops to visit a friend for one hour.
- He then completes his drive to Toronto at a faster rate than any other segment of his trip.

Which graph best describes his trip?

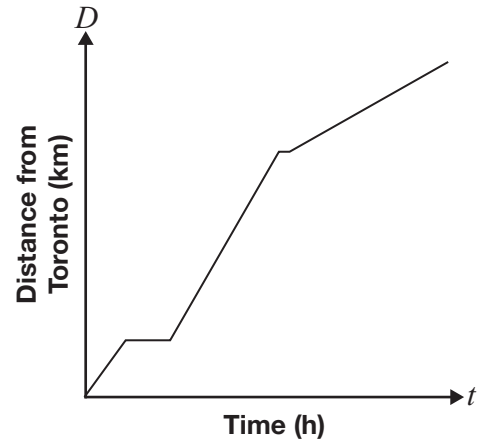
a Distance from Toronto vs. Time



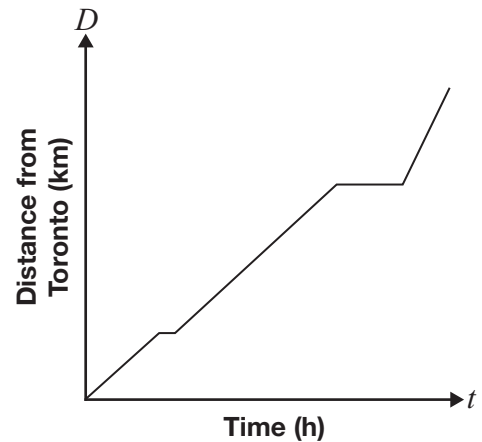
b Distance from Toronto vs. Time



c Distance from Toronto vs. Time



d Distance from Toronto vs. Time



22 Dan needs to get his car fixed.

- Fast Freddie charges \$440 for materials, plus \$50 per hour for labour.
- Rapid Ron charges \$360 for materials, plus \$60 per hour for labour.

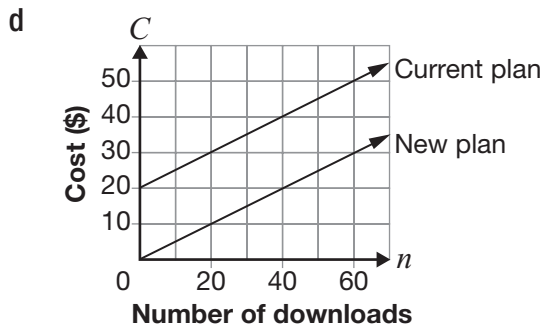
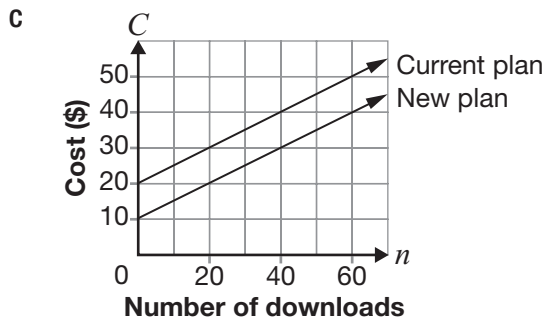
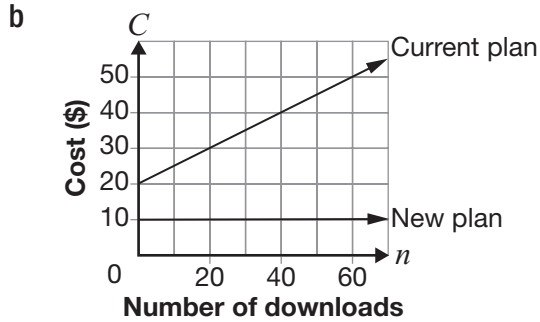
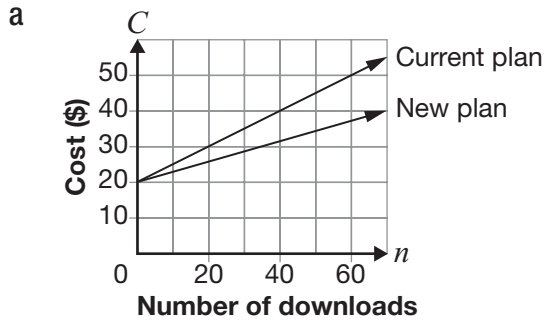
Which repair shop charges less for a 5-hour job, and how much less?

- Rapid Ron charges \$80 less.
- Fast Freddie charges \$30 less.
- Rapid Ron charges \$30 less.
- Fast Freddie charges \$10 less.

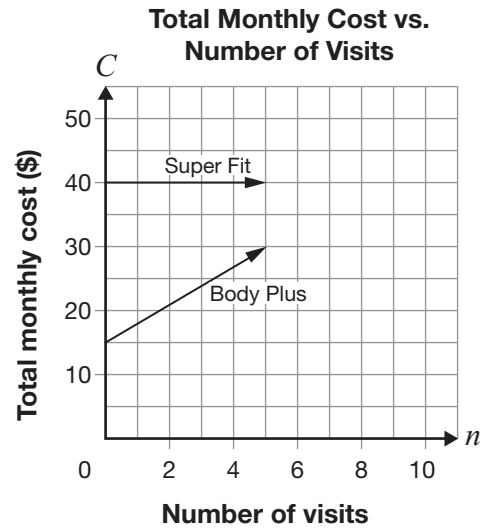
23 The current plan for downloading music is made up of a flat fee of \$20 and a fee of \$0.50 per download.

A new plan is made up of a flat fee of \$10 and a fee of \$0.50 per download.

Which graph represents both plans?



24 Two health clubs, Super Fit and Body Plus, offer monthly memberships. The total monthly cost for each club is represented by the graphs below.

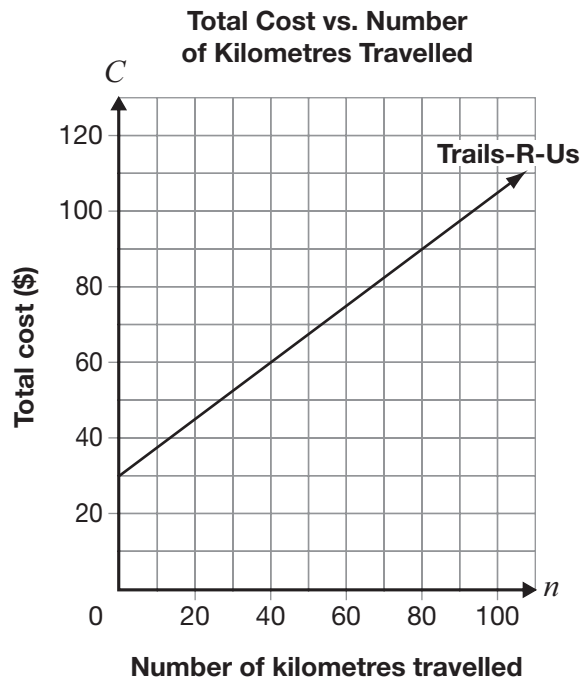


Which of the following is true?

- a Body Plus is always cheaper.
- b Super Fit is always more expensive.
- c Super Fit is cheaper if the number of visits is fewer than 7.
- d Body Plus is more expensive if the number of visits is greater than 9.

- 25** Corrina wants to rent a snowmobile for a day and considers two rental companies.

The relationship between the total cost of renting from Trails-R-Us and the number of kilometres travelled is represented by the graph below.



Off-Roads charges a flat rate of \$90 for a day with unlimited kilometres.

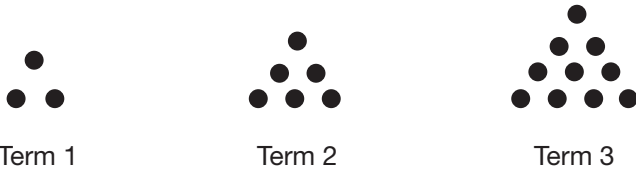
At how many kilometres is the total cost the same at both rental companies?

- a 70 km
- b 80 km
- c 90 km
- d 100 km



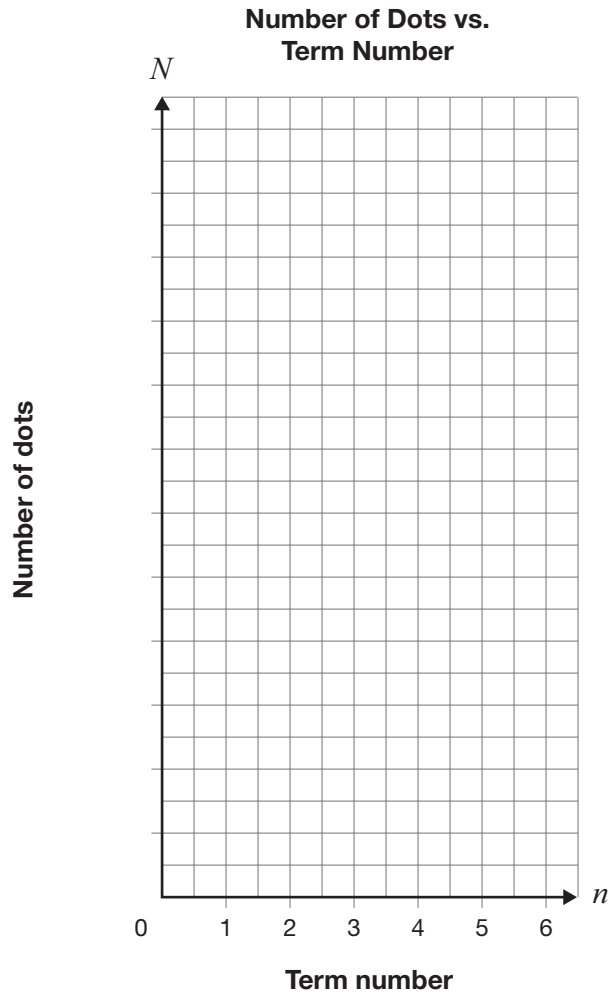
26 Stack It

Juan draws the first three terms of a pattern as shown below.



The pattern continues to grow in the same way. Complete the following table according to the pattern.

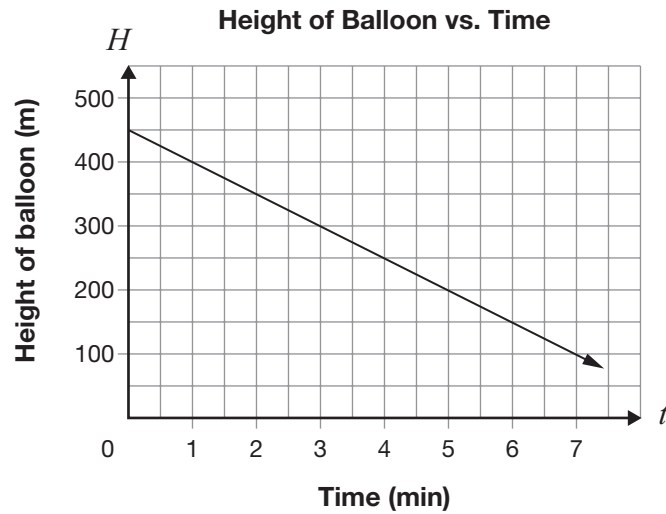
Term number, n	Number of dots, N
1	3
2	6
3	
4	
5	
6	



Graph the data from the table on the grid above. Add a scale for the N -axis.
 Draw a line or curve of best fit for the data.

27 Balloon Ride

The relationship between the height of a hot-air balloon, H , in metres, and time, t , in minutes, is represented below.



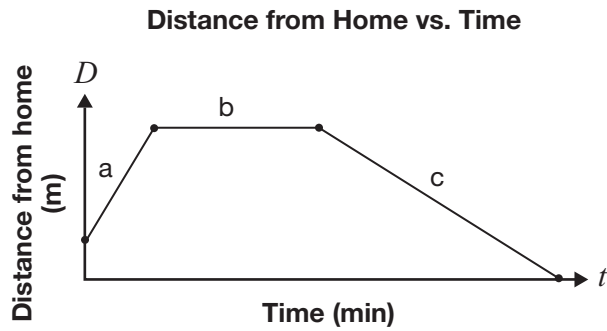
Determine an equation to represent the relationship between the height of the balloon and time.

$$H = \underline{\hspace{10em}}$$

Show your work.

28 Walk This Way

Mauro takes a walk. The graph below shows the relationship between Mauro’s distance from home and his walking time.

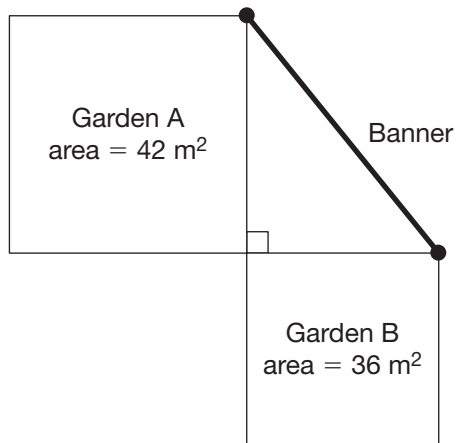


In the table below, compare Mauro’s distance from home, his speed and the direction in which he is travelling in the various segments of his walk.

Segment of graph	Comparison to other segments
a	
b	
c	

- 29** Which dimensions produce the smallest perimeter for a rectangular area of 120 m^2 ?
- a $2 \text{ m} \times 60 \text{ m}$
 - b $3 \text{ m} \times 40 \text{ m}$
 - c $4 \text{ m} \times 30 \text{ m}$
 - d $6 \text{ m} \times 20 \text{ m}$

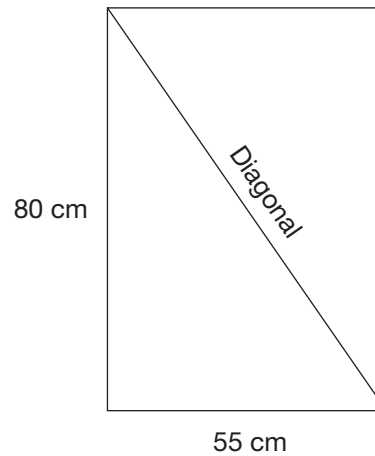
- 30** Two square gardens are shown below. A welcome banner extends from a corner of Garden A to a corner of Garden B.



Which is closest to the length of the banner?

- a 6 m
- b 9 m
- c 12 m
- d 78 m

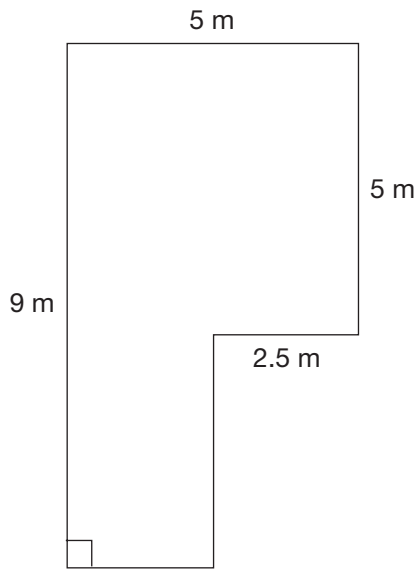
- 31** Use the Pythagorean theorem to find the length of the diagonal in the rectangle below.



Which is closest to the length of the diagonal?

- a 135 cm
- b 97 cm
- c 66 cm
- d 58 cm

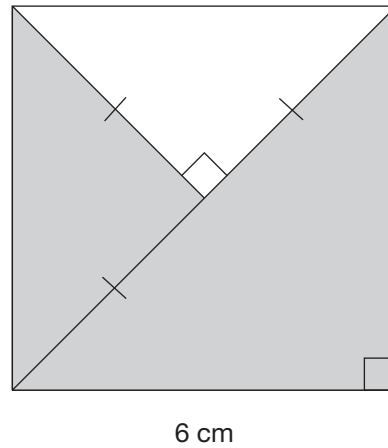
- 32** Hanna works painting sealant on driveways. She charges \$7.50/m².



How much will she charge to paint the driveway shown above?

- a \$215.00
- b \$262.50
- c \$280.00
- d \$337.50

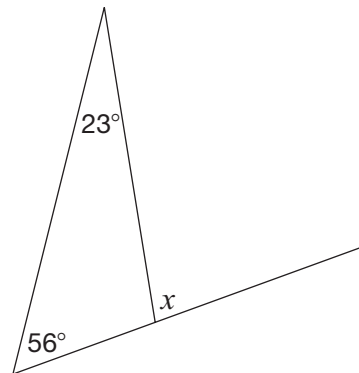
- 33** Consider the square below.



What is the area of the shaded part of the square?

- a 36 cm²
- b 27 cm²
- c 18 cm²
- d 9 cm²

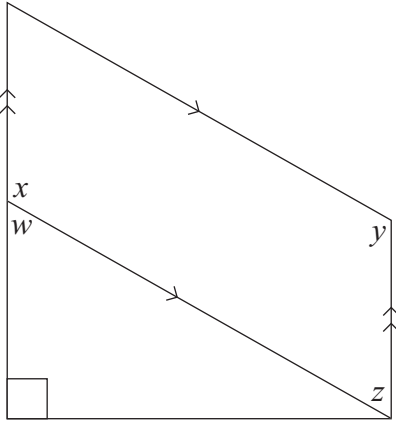
- 34** Consider the diagram below.



What is the value of x ?

- a 23°
- b 56°
- c 79°
- d 101°

35 Consider the diagram below.



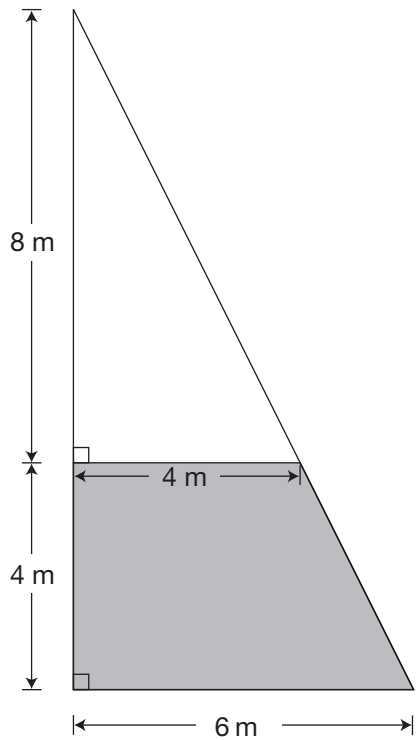
Which equation is true?

- a $x = z$
- b $w = y$
- c $y + z = 180^\circ$
- d $w + z = 180^\circ$



36 Wind in My Sails

A sail for a sailboat is represented below.



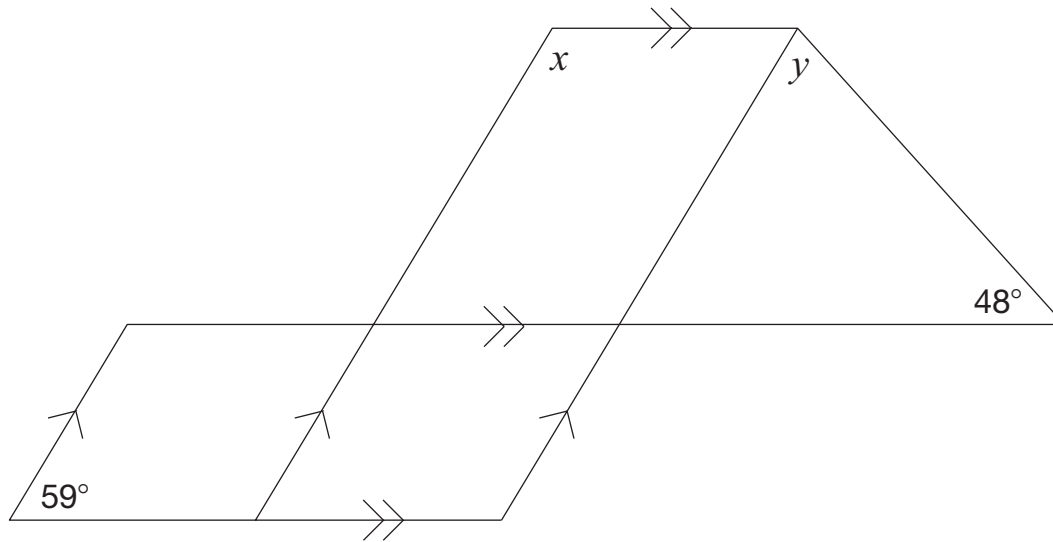
The unshaded part of the sail is made with material that costs $\$32/\text{m}^2$.
The shaded part of the sail is made with material that costs $\$125/\text{m}^2$.

Determine the total cost of the sail.

Show your work.

37 Designing

Consider the design below.



Complete the table below with the values of x and y .

Justify your answers using geometric properties.

Value	Justification using geometric properties
$x =$ _____	
$y =$ _____	

Education Quality and
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