

Academic

Grade 9 Assessment of Mathematics

2011

SAMPLE ASSESSMENT QUESTIONS

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

Education Quality and
Accountability Office



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.

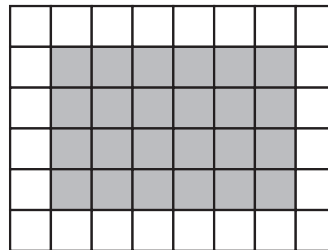
Answering Multiple-Choice Questions


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:

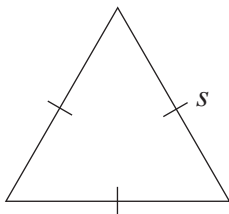
Give reasons and evidence to show your answer is correct.

Show your work:

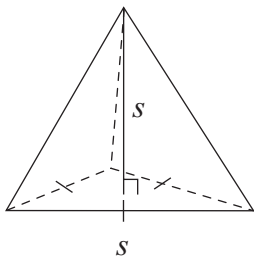
Record all calculations and all the steps you went through to get your answer. You may use words, numbers, graphs, diagrams, symbols and/or charts.

- 1** Which of the following has a volume that can be represented by s^3 ?

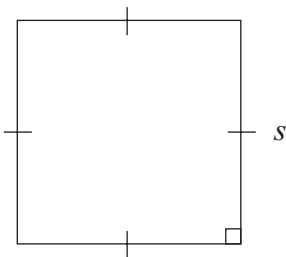
a



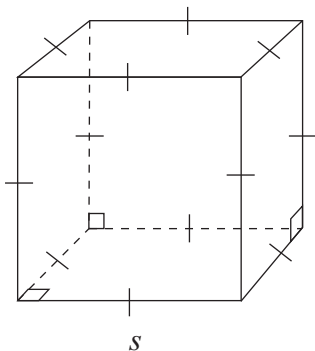
b



c



d



- 2** What value of m makes the equation $\frac{6a^m}{2a^3} = 3a^5$ true?

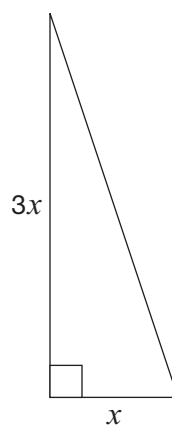
- a 2
- b 8
- c 15
- d 18

- 3** What is the value of the expression

$$\frac{5(-18 + 12)}{-4 + 1}?$$

- a 10
- b 6
- c -6
- d -10

- 4** Luke designs a garden in the shape of a right triangle as shown below.



The total area of the garden is 96 m^2 .

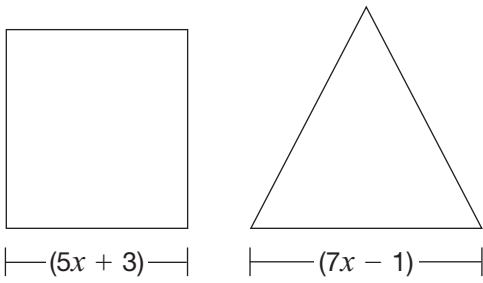
Hint:

$$A = \frac{1}{2}bh$$

Which is closest to the value of x in the diagram?

- a 6 m
- b 8 m
- c 32 m
- d 64 m

- 5** A square and an equilateral triangle are pictured below.



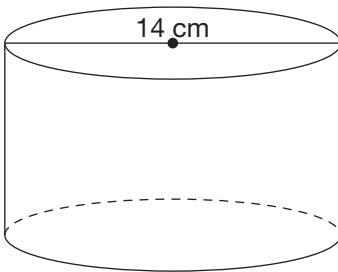
If the square and the triangle have the same perimeter, what is the value of x ?

- a 2
- b 4
- c 9
- d 15



6 How High Is It?

The cylinder pictured below has a surface area of 660 cm^2 .



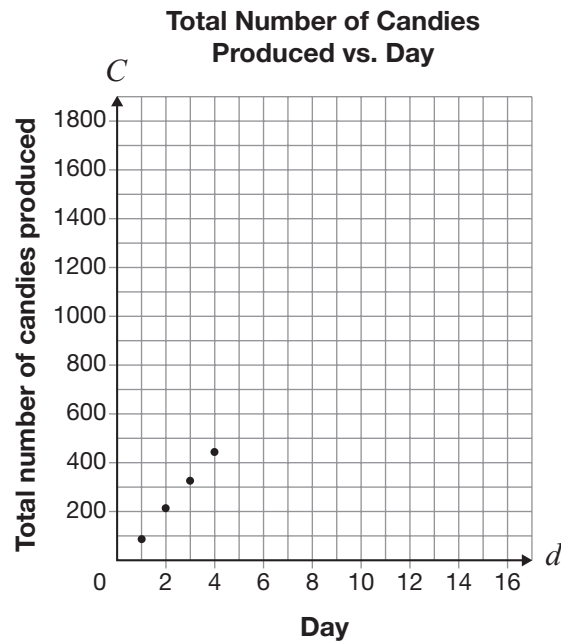
Use the following formula to determine the height of the cylinder:

$$\text{Surface area} = 2\pi r^2 + 2\pi rh$$

Show your work.



- 7** Dechen has a candy-making business. The graph below shows the total number of candies his business has produced by the end of each day for the first four days.



If this trend continues, which of the following points represents a day with more candies produced than expected?

- a (5, 500)
- b (9, 850)
- c (10, 1300)
- d (14, 1400)

- 8** Karina has a job at a video store. The total she is paid each week is made up of an hourly rate plus \$14 for transportation.

One week, she works 20 hours and is paid \$215.

Which equation represents the relationship between Karina's total pay, P , in dollars, and the number of hours she works, n ?

- a $P = 10.75n + 14$
- b $P = 14n + 10.75$
- c $P = 10.05n + 14$
- d $P = 14n + 10.05$



- 9** Which table of values shows a linear relation between C and n ?

a

n	C
0	0
1	2
2	4
3	8

b

n	C
0	0
1	1
2	4
3	9

c

n	C
0	0
1	4
2	11
3	15

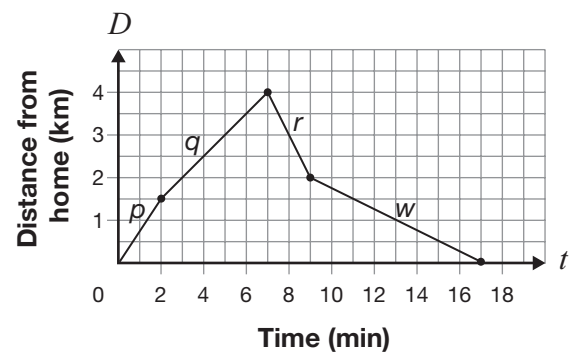
d

n	C
0	0
1	3
2	6
3	9

- 10** Which relation does **not** have an initial value of 50?

- a** $y = 50$
b $y = 50 + 8x$
c $y = 50x$
d $y = 50 - x$

- 11** The graph below represents the relationship between Rena's distance from home and time.



During which section of the graph does Rena travel the fastest?

- a** p
b q
c r
d w

- 12** The table below represents a linear relation.

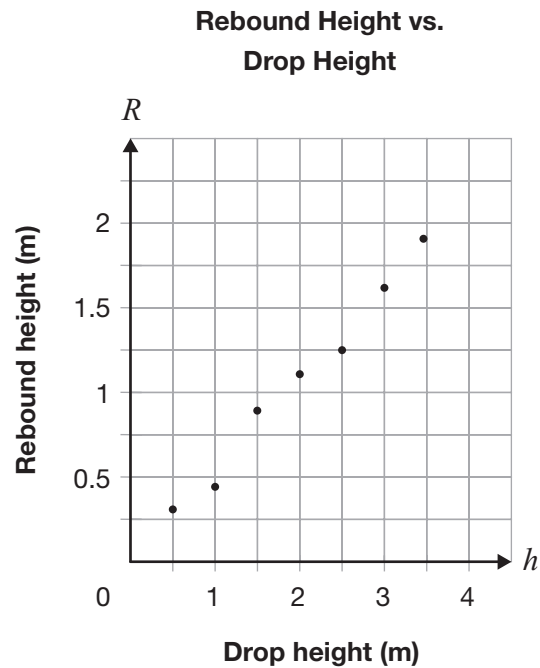
Time, t	Distance, D
0	5
1	15
2	25
3	35
4	45

Which equation represents this relation?

- a** $D = 5t$
b $D = 10t$
c $D = 10t + 5$
d $D = 5t + 10$

13 Follow the Bouncing Ball

This scatter plot shows the relationship between the rebound height of a ball and the height from which the ball is dropped.



Draw a line of best fit for the data on the grid above.

Determine an equation for your line of best fit.

Show your work.

Equation of line of best fit: _____

14 Getting Paid

Hannah's total pay includes a base salary and a percent of her sales.

The following table shows her total pay for three different sales levels.

Sales (\$)	Total pay (\$)
15 000	1700
17 500	1825
28 000	2350

Determine Hannah's total pay when her sales are \$47 000.

Show your work.



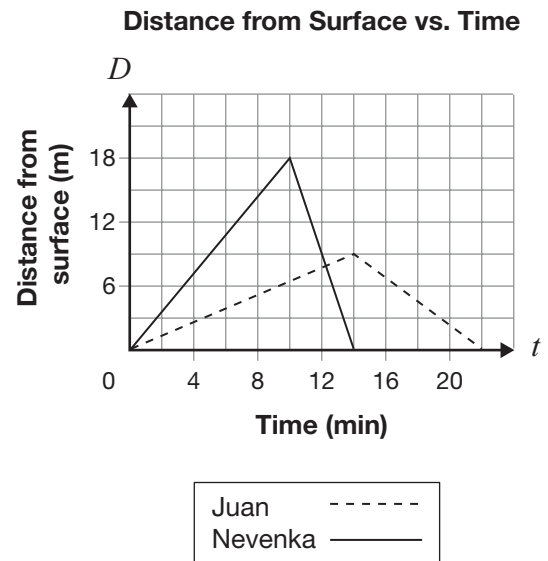
15 Which of the following **cannot** be an equation of a line?

- a $x = 2$
- b $y = 7$
- c $y = 2x^2 + 7$
- d $2x + y + 7 = 0$

16 Which of the following is the equation of the line $6x - 2y - 12 = 0$ in the form $y = mx + b$?

- a $y = -3x + 6$
- b $y = 3x - 6$
- c $y = -\frac{1}{3}x + 12$
- d $y = \frac{1}{3}x - 12$

17 Nevenka and Juan scuba dive. The graph below represents the relationship between the distance from the surface, in metres, and time, in minutes, for both divers as they swim down from the surface and then swim back up.



Which statement below is true?

- a Juan swims back up at a rate of 0.5 m/min.
- b Nevenka swims back up at a rate of 4.5 m/min.
- c Nevenka swims down faster than she swims back up.
- d Juan swims down and back up at the same rate.

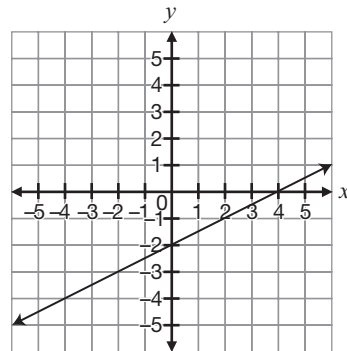
- 18** Alex has \$150. She spends the same amount each week. After 6 weeks, she has \$30 remaining.

The relationship between the amount of money Alex has and the number of weeks is represented by a line. What is the slope of this line?

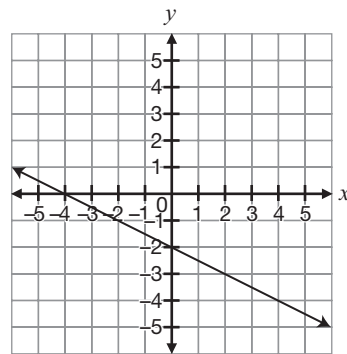
- a -25
- b -20
- c 20
- d 25

- 19** Which of the following represents the graph of the equation $2x - 4y = 8$?

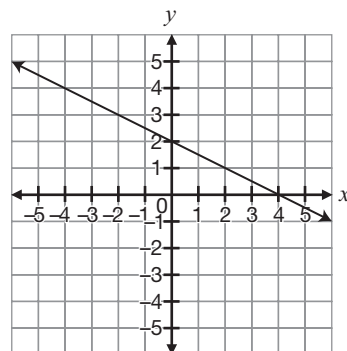
a



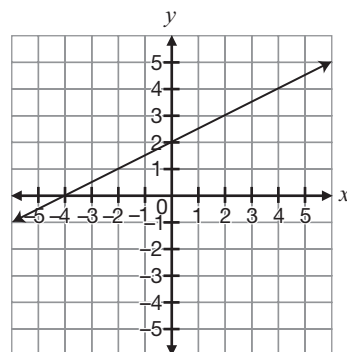
b



c



d



20 Which equation represents a line that has the same y -intercept as $2x + 3y - 6 = 0$?

- a $y = \frac{1}{2}x + 2$
- b $y = 2x - 2$
- c $y = -\frac{1}{2}x + 6$
- d $y = -2x - 6$

21 Nate buys a video-game system.

- The system costs \$300.
- Games cost \$60 each.
- He pays 13% tax on the system and on each game.
- He has \$850 in total to spend.

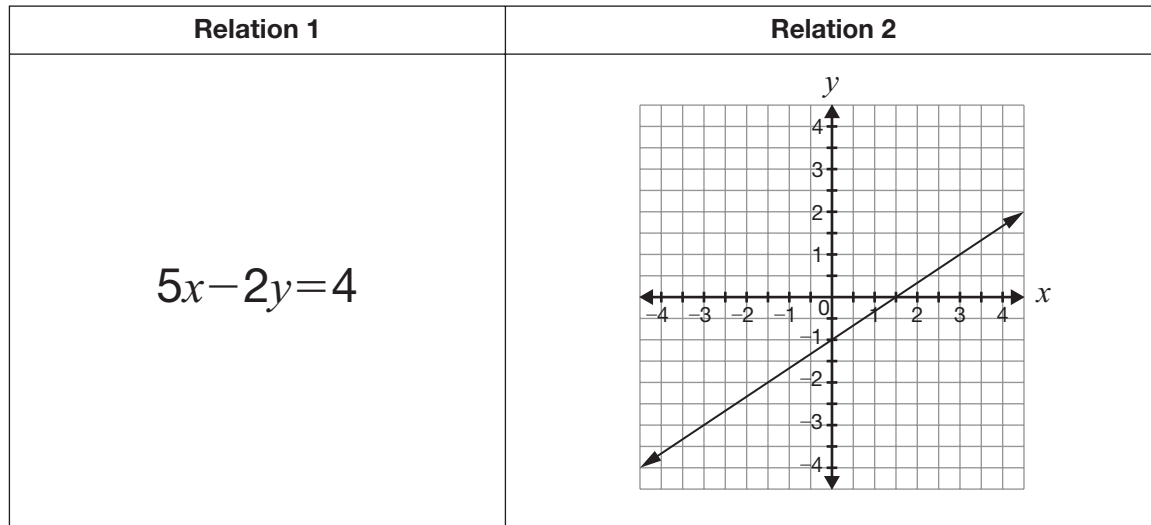
After he pays for the system, how many games is Nate able to buy?

- a exactly 12
- b exactly 9
- c no more than 7
- d no more than 3



22 Hit the Slopes

Consider the two relations represented below.



Determine the slope of the line representing each relation.

Show your work.

Slope of line representing Relation 1: _____

Slope of line representing Relation 2: _____

Which of these relations is represented by the steeper line?

Justify your answer.

23 How Many Uniforms?

The equation $C = 20n + 35$ represents the relationship between the cost of school volleyball uniforms, C , in dollars, and the number of uniforms ordered, n .

- The uniform company requires that the school order a minimum of 15 uniforms.
- The school has a maximum of \$600 to spend on the uniforms.

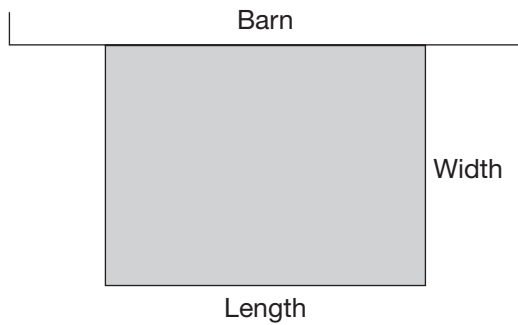
Determine the possible values for n and C in this situation.

Show your work.

The possible values for n are _____.

The possible values for C are _____.

- 24** Tom uses fencing to create a rectangular horse enclosure. He uses the side of a barn as one of the sides of the enclosure.

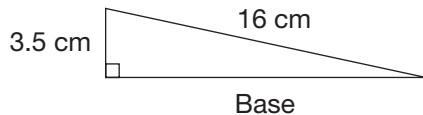


Tom has 48 metres of fencing to use for the three sides of the rectangular enclosure.

Which set of dimensions will use the entire 48 m of fencing?

- a width is 8 m, length is 6 m
- b width is 12 m, length is 12 m
- c width is 24 m, length is 12 m
- d width is 12 m, length is 24 m

- 25** Consider the following triangle.

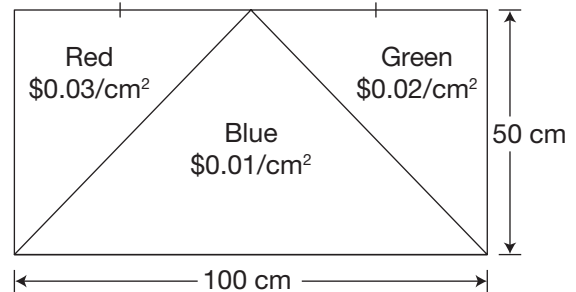


Which expression can be used in the process of determining the length of the base?

- a $16^2 - 3.5^2$
- b $16^2 + 3.5^2$
- c $\sqrt{16 + 3.5}$
- d $\sqrt{16 - 3.5}$

- 26** Pablo is designing a rectangular flag that consists of three coloured triangles.

The picture below shows the colours of the triangles and the cost of each colour of material.



What is the total cost of the material?

- a \$75.00
- b \$87.50
- c \$150.00
- d \$175.00

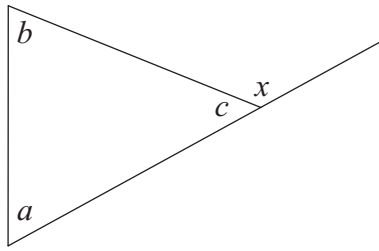
- 27** A cylinder has a volume of $400\pi \text{ cm}^3$ and a diameter of 20 cm.

Which of the following is closest to the height of the cylinder?

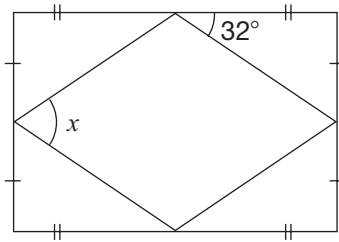
- a 1 cm
- b 4 cm
- c 20 cm
- d 40 cm

- 28** Consider the diagram below.

Which of the following equations is always true?



- a** $x = a + b$
b $x = b + c$
c $x = a - b$
d $x = b - c$
- 29** A rectangular sign is built as shown below. The four supports for the back of the sign form four congruent triangles.



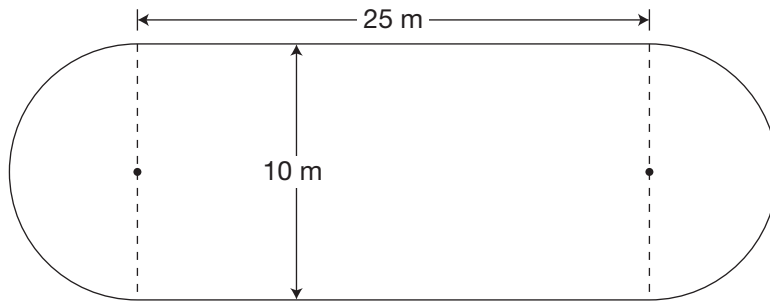
What is the value of x ?

- a** 26°
b 32°
c 58°
d 64°



30 Building an Ice Rink

Jake builds an ice rink as shown below.



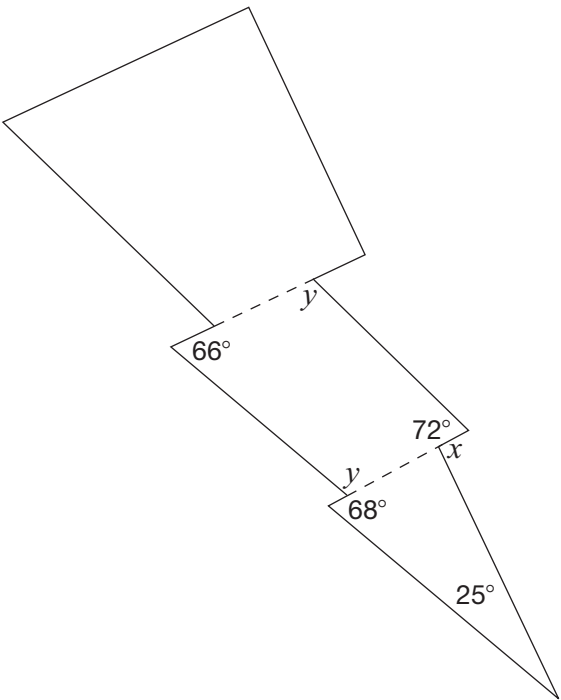
Determine the perimeter of the rink.

Show your work.



31 Shazam

Pravin designs a lightning bolt using two quadrilaterals and one triangle as shown below.



Complete the table below.
Justify your answers using geometric properties.

Angle measure	Justification
$x = \rule{1cm}{0.4pt}$	
$y = \rule{1cm}{0.4pt}$	

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