

Academic

Grade 9 Assessment of Mathematics

Spring 2009

SAMPLE ASSESSMENT QUESTIONS

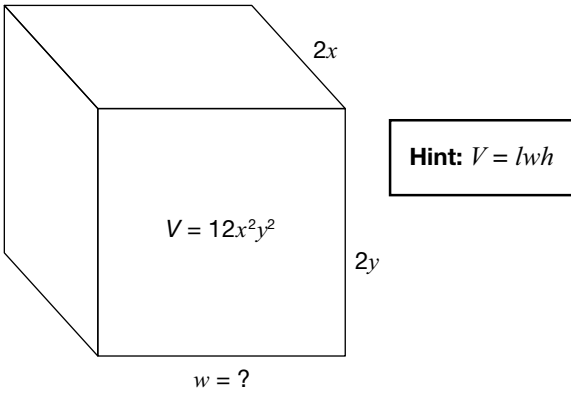
**Record your answers to the multiple-choice questions
on the blank Student Answer Sheet (Spring 2009, Academic).**

Education Quality and
Accountability Office



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

- 1** A box with a volume of $12x^2y^2$ is shown below.



What is the width of the box?

- a $2xy$
 - b $3xy$
 - c $4x^3y^3$
 - d $8x^3y^3$
- 2** Which of the following is equivalent to the expression below?
- $$(4x - 5) + (2x + 1)$$
- a $2x - 6$
 - b $2x - 4$
 - c $6x - 6$
 - d $6x - 4$

- 3** Alfredo and his wife, Jody, work in a restaurant.

Last week Alfredo received an average of \$15 in tips for each of the 55 tables he served. Jody received an average of \$20 in tips for each of the 60 tables she served.

They are planning a weekend trip. Alfredo will pay a total of \$220 for their hotel room and Jody will pay a total of \$160 for their rental car.

How much of their combined tips will be left over after they have paid for their hotel room and rental car?

- a \$1620
- b \$1645
- c \$2025
- d \$2405

4 Keepin' Tabs

A student council collects aluminum pop tabs to raise money to purchase a wheelchair. A company buys the pop tabs for \$0.88 per kilogram.

If 1267 pop tabs have a mass of one pound, how many pop tabs are needed to purchase a wheelchair worth \$1500?

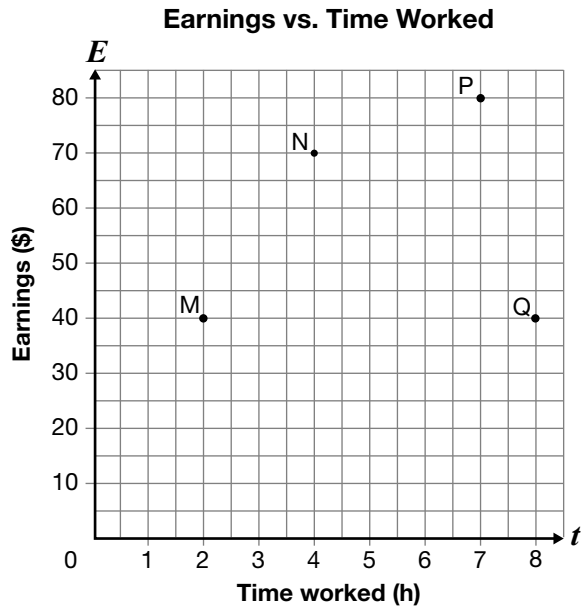
Show your work.

Hint:

1 kilogram = 2.2 pounds



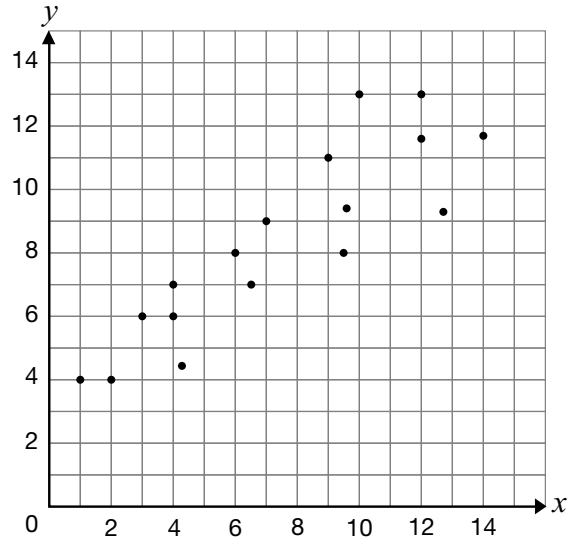
- 5** The graph below represents the relationship between earnings and time worked.



Which of the following points represents the highest rate of pay?

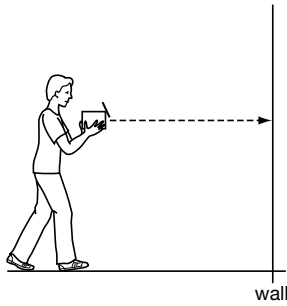
- a M
- b N
- c P
- d Q

- 6** Which of the following could be the slope of a line of best fit for the data shown in the scatter plot below?



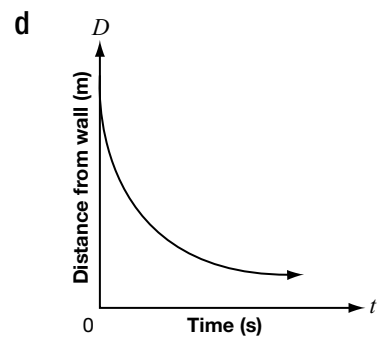
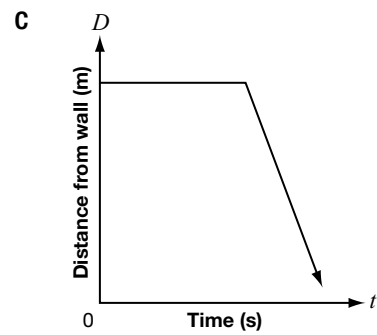
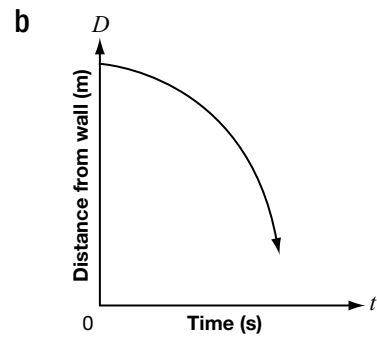
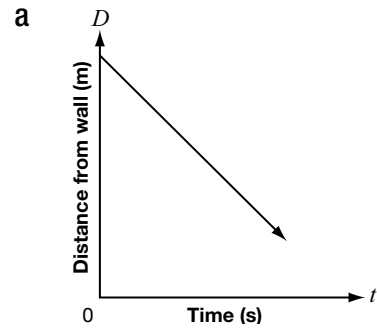
- a -2
- b -1
- c 1
- d 2

- 7** In an investigation, a student holds a motion detector, points it at a wall and walks toward the wall.



The student walks slowly at first and then speeds up as he approaches the wall.

Which of the following graphs would be produced on the graphing calculator?



- 8** The table of values below displays the cost of renting a bicycle.

Time, t (h)	Cost, C (\$)
0	25
1	30
2	35
3	40

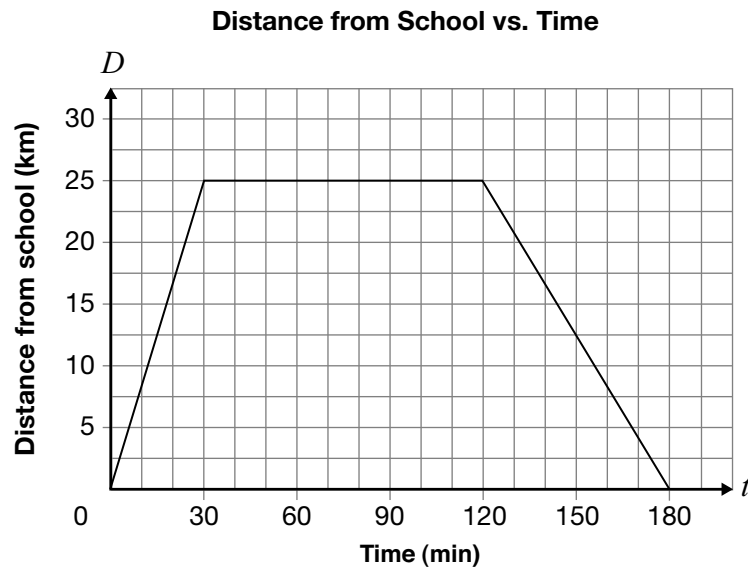
Which equation models the cost of renting a bicycle?

- a $C = 5t$
- b $C = 25t$
- c $C = 5t + 25$
- d $C = 25t + 5$



9 Dogs Versus Cats

The Bryant Bulldogs basketball team takes the bus to play the Jordan High Thundercats.



Describe the three parts of the Bulldogs' bus trip, using the information on the graph.

Include information about distance, time, direction and speed in kilometres per minute for each section of the graph.

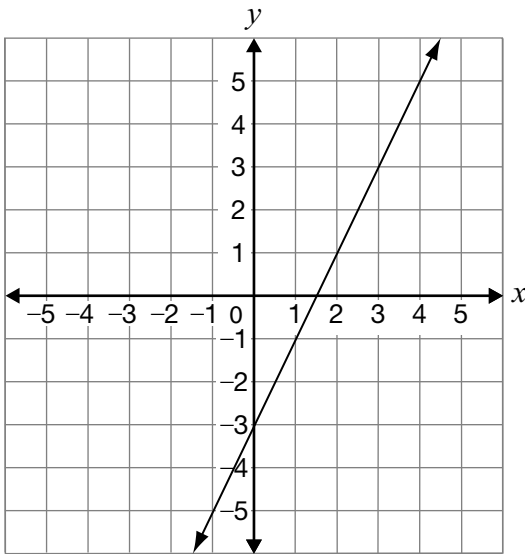
10 Which of the following equations does **not** represent a linear relation?

- a $x = -2$
- b $y = 3x - 1$
- c $y = x^2 + 3$
- d $3x - 2y - 1 = 0$

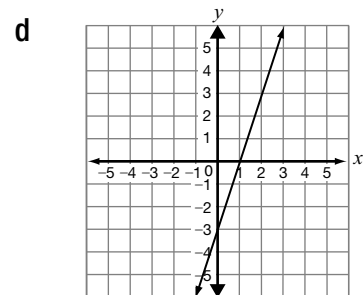
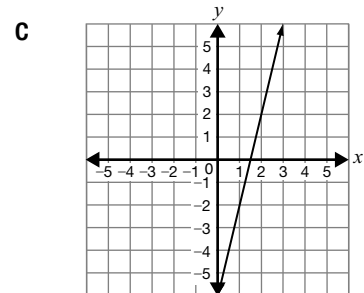
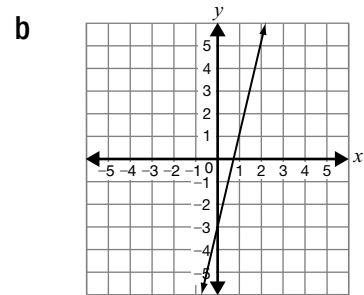
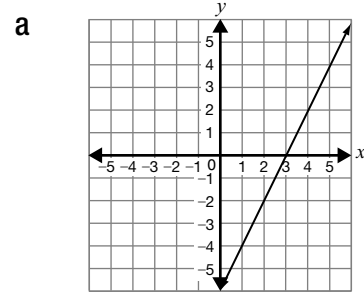
11 For the slope of a line, the change in x is greater than the change in y . Which of the following could represent the slope of this line?

- a $\frac{4}{3}$
- b 2
- c 1
- d $\frac{2}{5}$

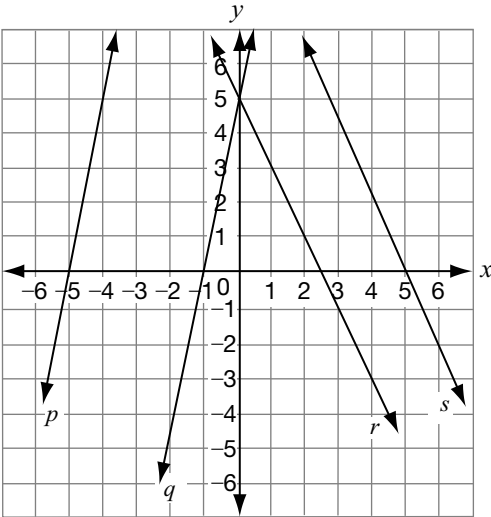
12 The graph of a line is shown below.



If the slope is doubled and the y -intercept remains constant, which graph below best represents the new line?



- 13** Consider the following linear relations.



Which line represents the graph of the equation $y = -2x + 5$?

- a Line p
 - b Line q
 - c Line r
 - d Line s
- 14** The following table shows values for a linear relation.

x	y
-15	-33
-9	-25
3	-9
12	3

Which of the following equations represents the relationship shown in the table of values?

- a $y = \frac{4}{3}x - 16$
- b $y = \frac{4}{3}x - 13$
- c $y = \frac{3}{4}x - 9$
- d $y = \frac{3}{4}x - 6$



15 A Tale of Two Lines

Below are the equations of two lines.

Line A: $x - 2y + 8 = 0$

Line B: $2x + y + 1 = 0$

Compare the two lines by considering their slopes.

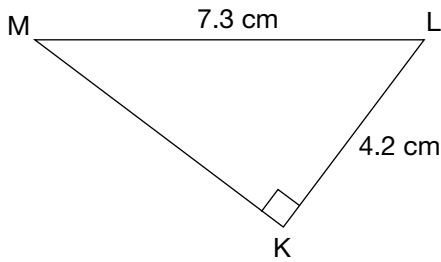
Justify your answer.

Hint:

Include information about

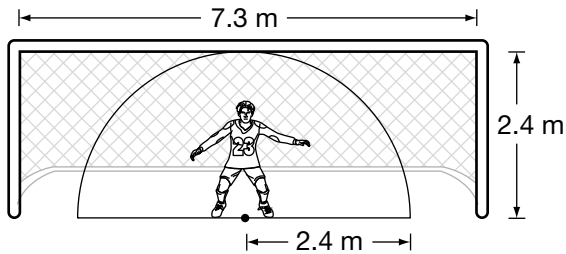
- steepness,
- direction and
- whether the lines are parallel or perpendicular, or whether they are neither.

- 16** Triangle KLM is shown below.



Which of the following is closest to the perimeter of triangle KLM?

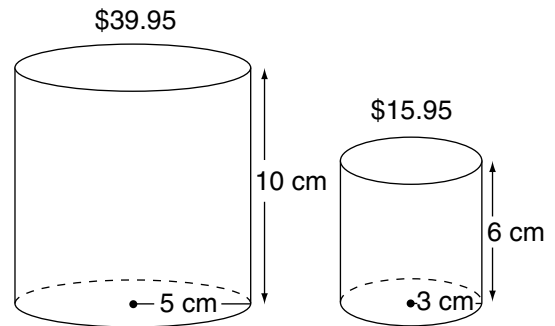
- a 12.6 cm
 - b 16.3 cm
 - c 17.5 cm
 - d 21.0 cm
- 17** A soccer goalie is standing in a goal opening. From this position, she can guard the area represented by the semicircle below.



How much of the goal opening is she not guarding?

- a 0.6 m^2
- b 8.5 m^2
- c 9.0 m^2
- d 26.6 m^2

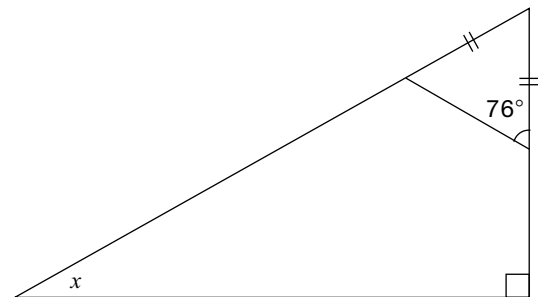
- 18** Two different stores sell coffee in cylindrical packages. The prices and dimensions of the packages from the two stores are shown below.



Which is closest to the difference between the unit prices of these two packages?

- a $\$0.04/\text{cm}^3$
- b $\$0.05/\text{cm}^3$
- c $\$0.09/\text{cm}^3$
- d $\$0.24/\text{cm}^3$

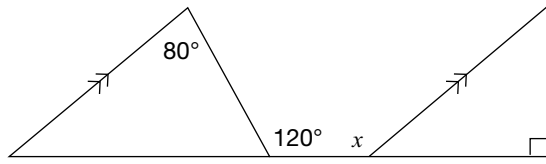
- 19** Consider the following diagram.



What is the value of x ?

- a 14°
- b 28°
- c 62°
- d 76°

20 Consider the diagram below.



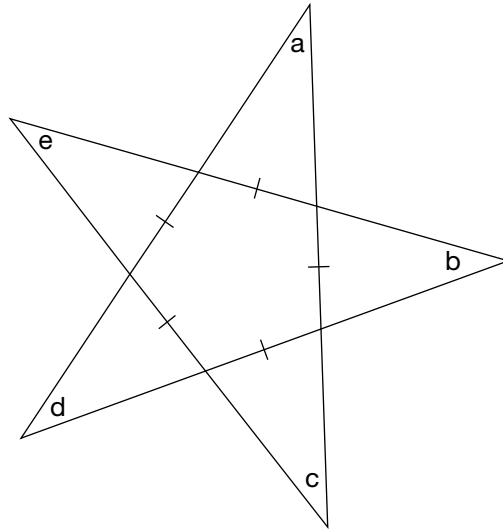
What is the value of x ?

- a 80°
- b 120°
- c 140°
- d 170°



21 Twinkle Twinkle

Nicole notices the star design shown below on the pavement outside a movie theatre.



Determine the sum of the angle measures in the corners of this star: $a + b + c + d + e$.

Justify your answer using geometric properties.

Sample Assessment Questions: Academic

Answer Key

1. a b c d

2. a b c d

3. a b c d

4. Respond in booklet.

5. a b c d

6. a b c d

7. a b c d

8. a b c d

9. Respond in booklet.

10. a b c d

11. a b c d

12. a b c d

13. a b c d

14. a b c d

15. Respond in booklet.

16. a b c d

17. a b c d

18. a b c d

19. a b c d

20. a b c d

21. Respond in booklet.

End of Assessment

Applied

Grade 9 Assessment of Mathematics

Spring 2009

SAMPLE ASSESSMENT QUESTIONS

**Record your answers to the multiple-choice questions
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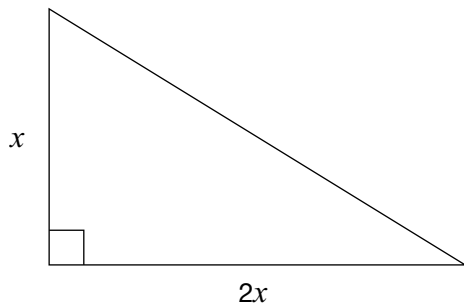
- 1** Darwin is making a drink that is a mix of crystals and water in a ratio of 2:5.

Darwin starts by mixing 4 cups of crystals with 9 cups of water.

How many more cups of water should he add to have a 2:5 ratio?

- a 0
- b 1
- c 2
- d 10

- 2** A gardener designs a rose bed in the shape of a right triangle. The ratio of the two shorter sides is 2:1.



If the area is 25 square units, what are the dimensions of the shorter sides?

Hint: $A = \frac{bh}{2}$

- a 1, 2
- b 1, 3
- c 5, 5
- d 5, 10

- 3** What is a simplified form of the expression $2x - 3 - 5x + 1$?

- a $3x - 2$
- b $3x + 2$
- c $-3x - 2$
- d $-3x + 2$

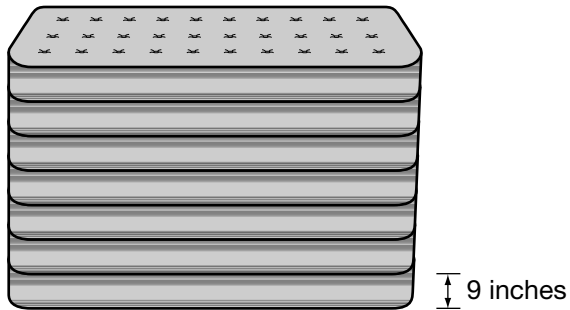
- 4** What is the value of x that satisfies the equation $4x - 9 = 2x + 3$?

- a 2
- b 3
- c 5
- d 6



5 Stacked High

A mattress company has 7000 mattresses to sell. The company claims that if all the mattresses are stacked on top of each other, the stack will be 3 times the height of the CN Tower.

**Hint:**

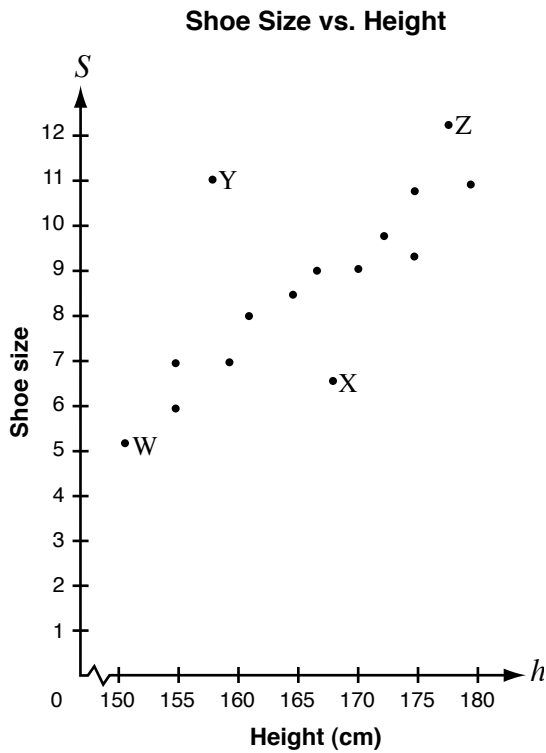
$$1 \text{ inch} = 2.5 \text{ cm}$$

$$1 \text{ m} = 100 \text{ cm}$$

The height of the CN Tower is 553 m and each mattress is 9 inches high. Is the company's claim true?

Justify your answer.

- 6** The graph shows the shoe sizes of girls of various heights.



Which point represents a girl whose shoe size is smaller than expected for a girl of her height?

- a W
- b X
- c Y
- d Z

- 7** Ali collects data to investigate how the area of the wall lit by an overhead projector increases as the projector moves away from the wall. The chart below shows Ali's data.

Distance from the wall (m)	Area on the wall (m ²)
1	1
2	4
3	9
4	16

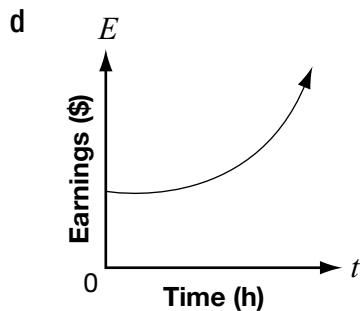
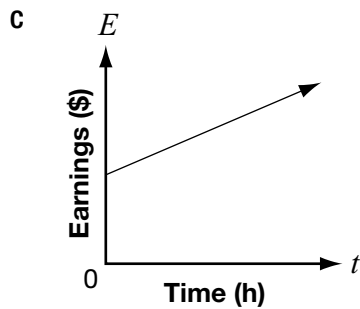
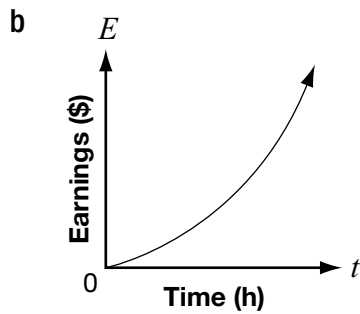
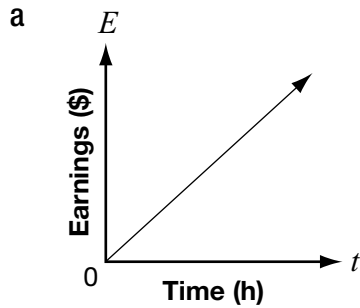
Which of the following trends does the data support?

As the distance increases, the area

- a increases at a constant rate.
- b decreases at a constant rate.
- c increases at an increasing rate.
- d decreases at an increasing rate.

- 8** Koshen is creating his own summer gardening job. For each garden, he will charge a \$10 initial consultation fee plus \$8 per hour.

Which graph best represents Koshen's earnings for each garden?



- 9** Which of the following tables represents a non-linear relation?

a

n	C
0	7
2	11
4	15
6	19
8	23

b

n	C
0	16
1	13
2	10
3	7
4	4

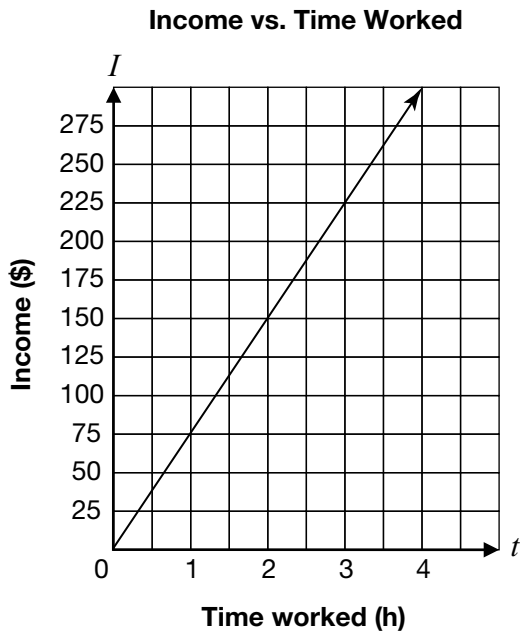
c

n	C
0	12
2	10
4	8
6	6
8	4

d

n	C
0	1
1	2
2	4
3	7
4	11

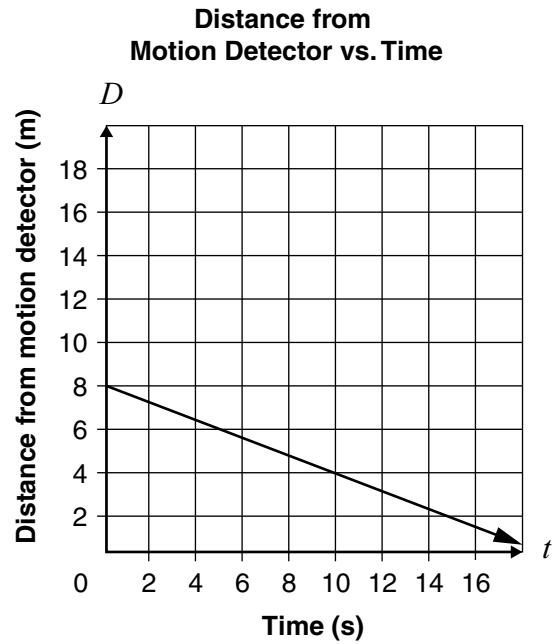
- 10** Joe owns an auto-repair shop. He charges his customers an hourly rate for repairs. The relationship between his income and the amount of time he works is shown below.



What is Joe's hourly rate?

- a \$25/hour
- b \$75/hour
- c \$150/hour
- d \$225/hour

- 11** The graph below shows the relationship between Rick's distance from a motion detector and the time he walks.



Which equation represents Rick's distance, D , from the motion detector based on time, t ?

- a $D = -\frac{2}{5}t + 8$
- b $D = \frac{2}{5}t + 8$
- c $D = -\frac{5}{2}t + 8$
- d $D = \frac{5}{2}t + 8$

- 12** The cost, C , in dollars of producing n yearbooks is represented by the equation

$$C = 1000 + 5n.$$

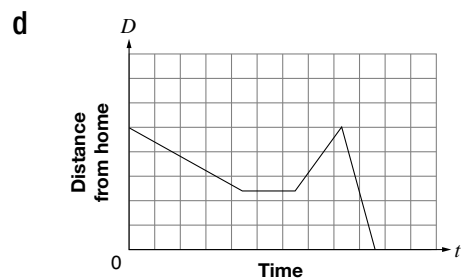
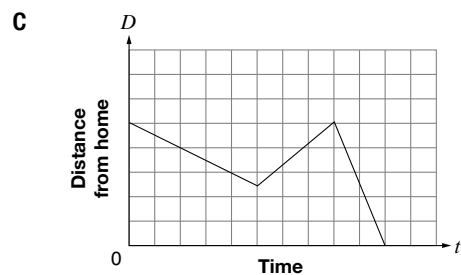
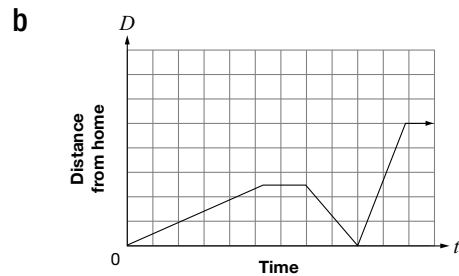
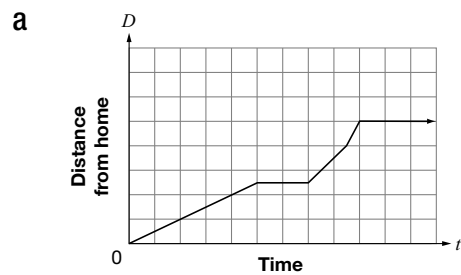
How much would it cost to produce 75 yearbooks?

- a \$375
- b \$625
- c \$1000
- d \$1375

- 13** **Maya's Trip to School**

- Maya walks to her friend Kadeem's house, which is halfway between her home and the school.
- They stay at Kadeem's house for a few minutes, until Maya remembers that she has forgotten her lunch.
- Maya runs back home to get her lunch.
- When she gets home, her mother drives her to school so that she will not be late.

Which graph most accurately represents Maya's trip to school?

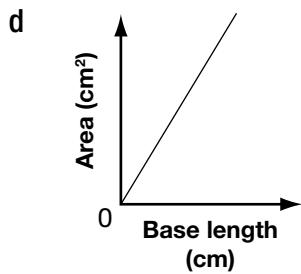
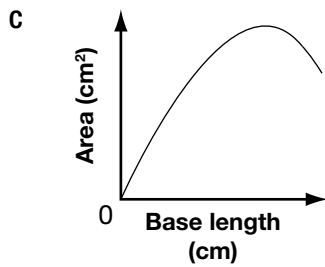
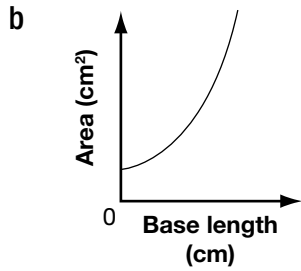
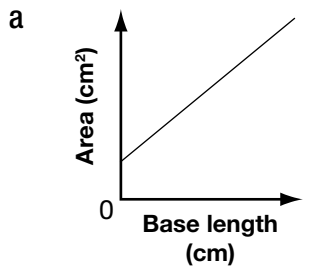


- 14 The data for five isosceles triangles with perimeters of 24 cm are shown below.

Triangles With 24 cm Perimeters

Length	Approximate Area of the Triangle
1 cm	6 cm ²
3 cm	16 cm ²
6 cm	25 cm ²
10 cm	24 cm ²
11 cm	19 cm ²

Which graph best represents the relationship between the base length and the area of the triangle?



15 Ripples in the Pond

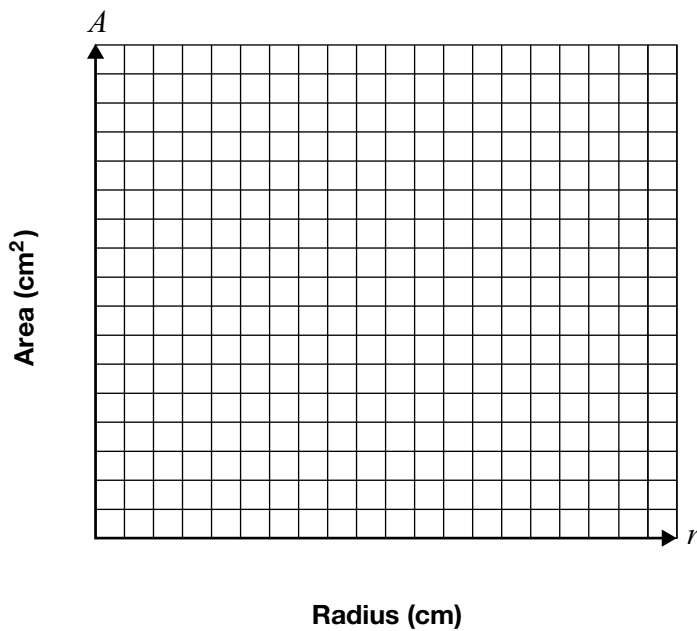
Quinn drops a pebble into a shallow pond and watches a circular wave ripple outward. The area of the circle increases as the radius increases.

Complete the table.

Radius (cm)	Area (cm ²)
0	
1	
2	
3	
4	
5	

Hint: Area of circle = πr^2

Graph these data below. Choose and label an appropriate scale for each axis.



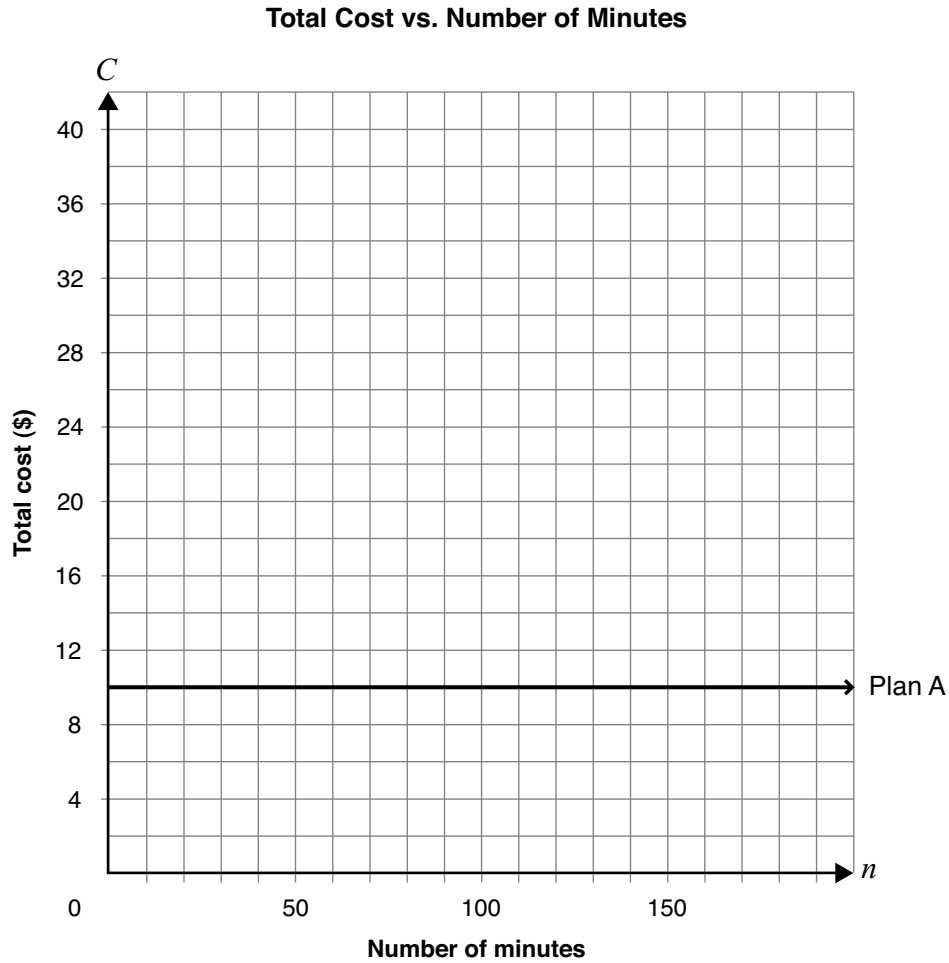
Draw a line or curve of best fit.

16 I'll Call You

Jasdeep has two options for long-distance phone calls.

- Plan A, as shown on the graph below, charges \$10.00 per month for unlimited minutes.
- Plan B charges \$0.20 per minute with no initial fee.

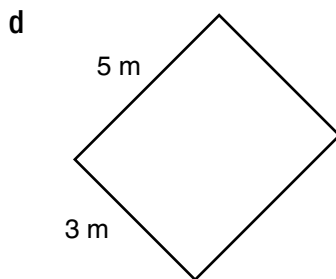
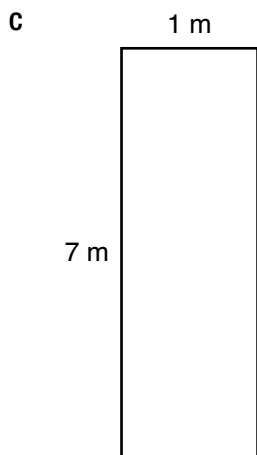
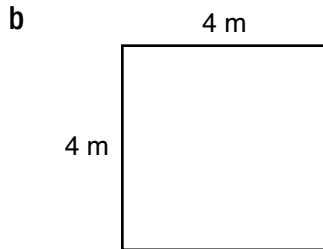
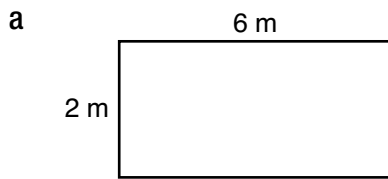
Graph Plan B on the grid below.



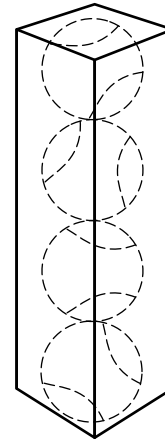
Determine under which conditions Jasdeep should select each plan.

Justify your answer.

- 17** Which of the following rectangles provides the maximum area for a perimeter of 16 m?

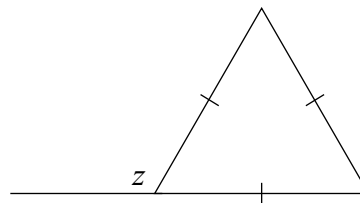


- 18** Tennis Inc. has decided to package 4 tennis balls in a box shaped like a rectangular prism. Tennis balls have a radius of 5 cm.



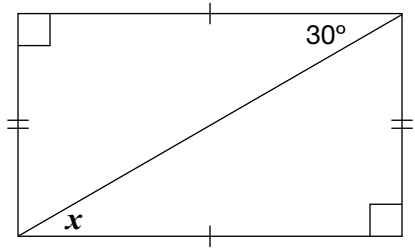
Which set of dimensions would tightly fit 4 tennis balls?

- a** $5 \text{ cm} \times 5 \text{ cm} \times 20 \text{ cm}$
b $5 \text{ cm} \times 5 \text{ cm} \times 40 \text{ cm}$
c $10 \text{ cm} \times 10 \text{ cm} \times 10 \text{ cm}$
d $10 \text{ cm} \times 10 \text{ cm} \times 40 \text{ cm}$
- 19** What is the value z in the diagram below?



- a** 60°
b 100°
c 120°
d 140°

20 Consider the diagram below.



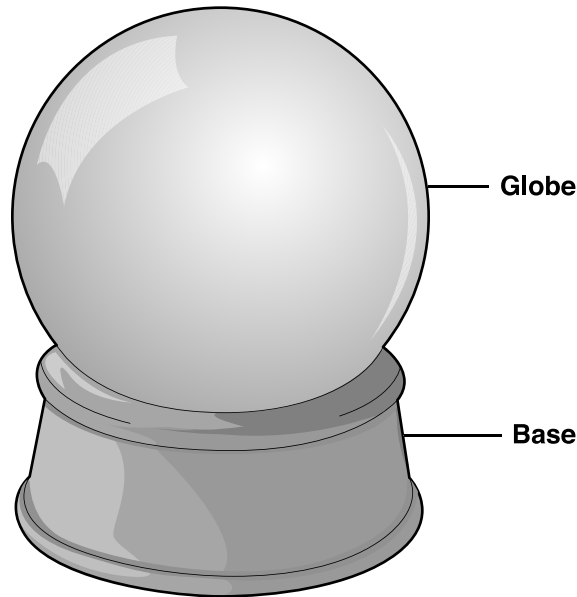
What is the value of x in the diagram?

- a 150°
- b 90°
- c 60°
- d 30°



21 Global Gift Shop

A gift shop sells water-filled spherical globes that sit on bases.



There are two sizes to choose from.

- A small globe has a radius of 6 cm.
- A large globe has a radius of 18 cm.

Mary thinks that the volume of water contained by the large globe is about three times the volume of water in the small globe.

Is she correct?

Circle one: Yes No

Justify your answer.

Sample Assessment Questions: Applied

Answer Key

1. a b c d
2. a b c d
3. a b c d
4. a b c d
5. Respond in booklet.
6. a b c d

7. a b c d
8. a b c d
9. a b c d
10. a b c d
11. a b c d

12. a b c d
13. a b c d
14. a b c d
15. Respond in booklet.
16. Respond in booklet.

17. a b c d
18. a b c d
19. a b c d
20. a b c d
21. Respond in booklet.

End of Assessment