Academic

Grade 9 Assessment of Mathematics

Spring 2008

SAMPLE ASSESSMENT QUESTIONS

Record your answers to the multiple-choice questions on the blank Student Answer Sheet (Spring 2008, Academic).

Education Quality and Accountability Office

EQAO

Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

1 The expression below can be simplified.

$$\frac{(x^2y)^3}{(xy)^2}$$

Which of the following shows the expression in its simplest form?

a x^4y

b x^4

c xy

d x^3y

2 Josie works in a sports store. She receives 8% of the total sales each day. One day, she receives $35 for her portion of the total sales. What are the total sales for that day?

a $37.80

b $43.75

c $280.00

d $437.50

3 Which of the following represents the expression $2(3x + 4) + 3(x - 1)$ in a simplified form?

a $9x + 3$

b $9x + 5$

c $8x + 8$

d $8x + 11$

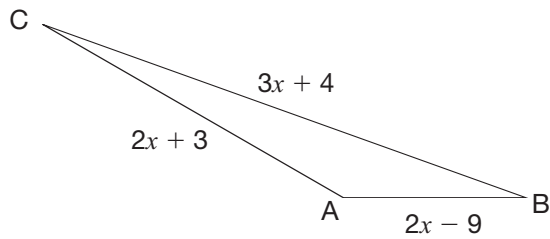**4** The distance covered in 5 laps of a circular track is 400π metres.
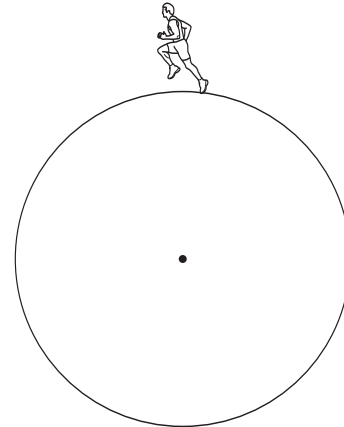
What is the shortest distance between any point on the track and the centre?

a 400 m

b 200 m

c 80 m

d 40 m

5 What Side?

The perimeter of the triangle below is 75 m.

C
$3x + 4$
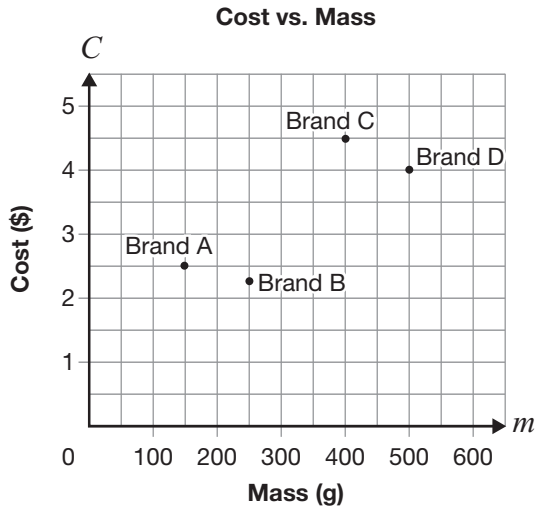$2x + 3$
A $2x - 9$ B

Determine the measure of each side of the triangle.

Show your work.

6 The following graph shows the relationship between the mass and the cost of four different brands of strawberry jam.

Cost vs. Mass

Which statement is true?

a Brand A has the lowest cost.

b Brand B has the smallest mass.

c Brand C has the highest cost per gram.

d Brand D has the lowest cost per gram.

7 Square gardens are arranged side by side as shown below.

1 garden   3 gardens   5 gardens
4 sides   10 sides   16 sides
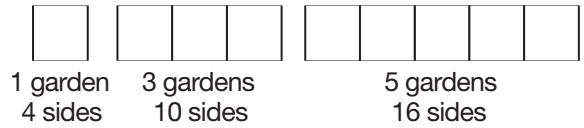
Which table of values represents the relationship between the number of gardens and the number of sides?

a

Number of gardens	Number of sides
1	4
2	8
3	12
4	16
5	20

b

Number of gardens	Number of sides
1	4
2	5
3	10
4	11
5	16

c

Number of gardens	Number of sides
1	4
2	6
3	10
4	14
5	16

d

Number of gardens	Number of sides
1	4
2	7
3	10
4	13
5	16

8 Gerry has a table of values representing a linear relation. Two of the numbers are hidden behind a ketchup spill.

x	y
−2	−6
−1	
0	
1	18

The values that are hidden are

a   −2 and 14.

b   0 and 12.

c   2 and 10.

d   3 and 9.

9 The graph below represents the cost to belong to a local gym.

Cost vs. Number of Months
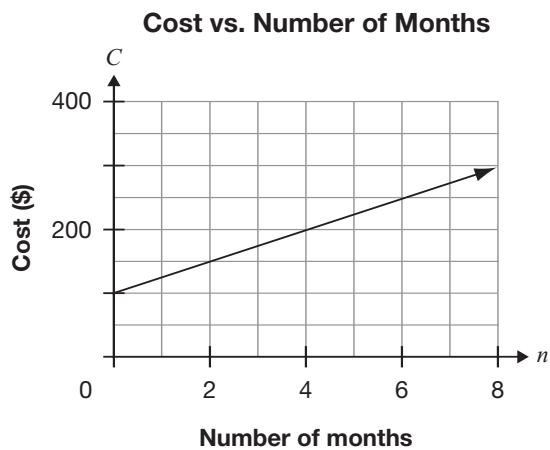
Which equation represents the graph?

a $C = \frac{1}{25}n + 100$

b $C = \frac{1}{2}n + 100$

**c** $C = 2n + 100$

d $C = 25n + 100$

⑩ Wing Length

Wing length is a reliable method for determining the age of young birds. Below is an example of data for a particular species.

Wing length (cm)	Age (days)
1.5	4
3.1	8
3.2	10
4.1	12
5.2	16

Determine the age of a bird with a wing length of 3.6 cm.

You may use the grid if you wish.

Justify your answer.

Age vs. Wing Length

A

Age (days)

18
16
14
12
10
8
6
4
2
0

   1   2   3   4   5   6   7 w

Wing length (cm)
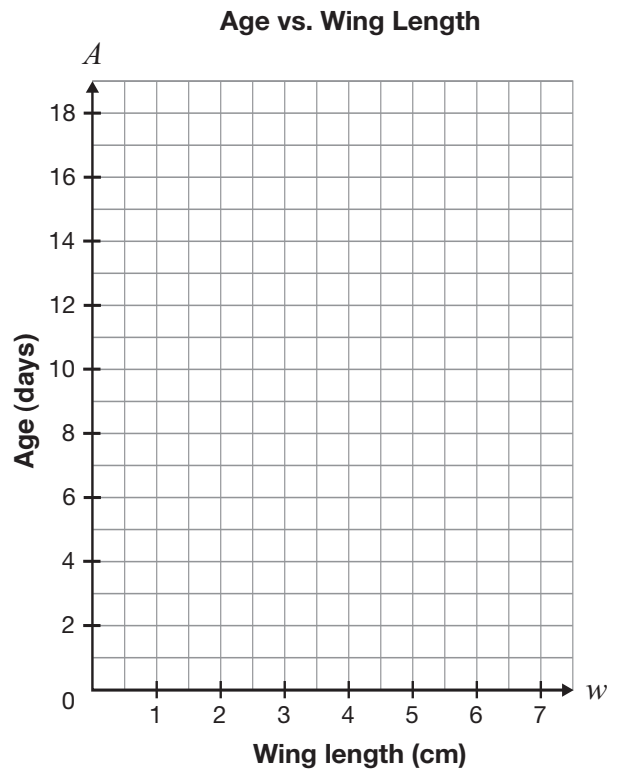
11 The table below shows examples of linear and non-linear equations.

Equation Examples

Linear equations	Non-linear equations
$y = 5x - 3$	$y = 5x^2 - 3$
$y = 125 - 4.25x$	$y = 2x^3$
$y = -3x$	$2x^2 + 5y^2 = 10$

Which of these statements best describes how linear equations are different from non-linear equations in the table above?

a The exponent of both variables in the linear equations is 1.

b The exponent of exactly one variable in the linear equations is 1.

c The exponent of both variables in the non-linear equations is 1.

d The exponent of exactly one variable in the non-linear equations is 1.

**12** The relation shown below can be expressed as $3x + 4y - 180 = 0$.
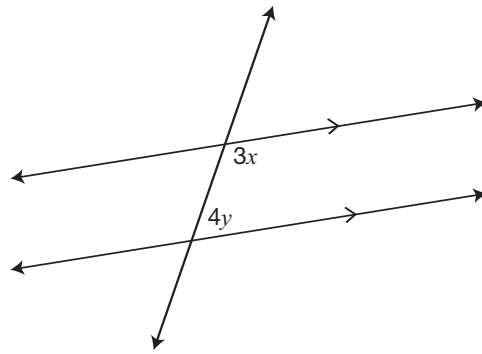
Another way to write this relation is

a $y = \frac{3}{4}x - 45.$

b $y = -\frac{3}{4}x + 45.$

c $y = -\frac{4}{3}x + 60.$

d $y = \frac{4}{3}x - 60.$

13 How would the graph of the relation $y = 3x - 2$ change if the 3 and -2 were both doubled?

The graph would be

a steeper and have a lower y-intercept.

b steeper and have a higher y-intercept.

c less steep and have a lower y-intercept.

d less steep and have a higher y-intercept.

14 Consider the points A(1, 4), B(6, 3), C(−1, 5), D(−3, 0) and E(2, −1).
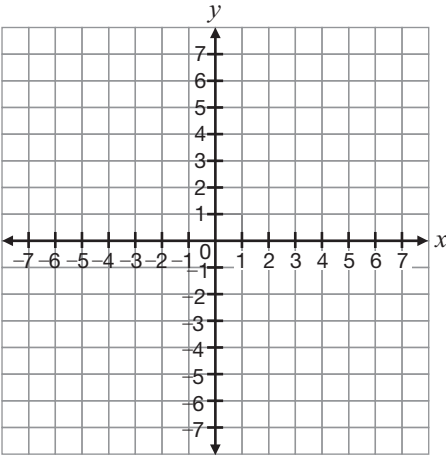
Which line segment is parallel to AB?

a AE

b BE

c CE

d DE

15 Identical bottles are packed in a box. The box will hold a maximum of 38 bottles. The relationship between M, the total mass of the box and its contents, and n, the number of bottles in the box, is represented by the equation $M = 500n + 800$.

Which of the following are possible integer values for the variable n?

a n is greater than 37.

b n is greater than or equal to 0.

c n is greater than 0 but less than 39.

d n is greater than or equal to 0 but less than 39.

16   **Excellent Equations**

A line is perpendicular to the line $y = 2x + 3$ and has the same **_x_-intercept** as $x + 3y + 10 = 0$.

Find the equation of this line. Express your answer in the form $y = mx + b$.

Justify your answer.

17 Maria grows several varieties of plants in a rectangular-shaped garden. She uses fencing to divide the garden into 16 squares that are each 1 m by 1 m. She also puts fencing around the perimeter of the garden.

Which of the following represents the smallest amount of fencing that Maria needs?

a   24 m

b   40 m

c   42 m

d   49 m

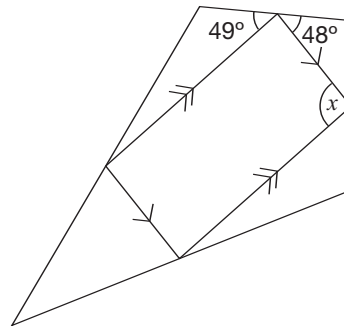**18** The mould shown below is used to make a candle in the shape of a square-based pyramid.
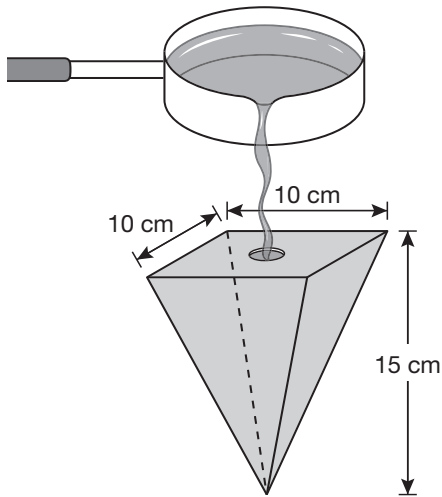
What is the volume of the mould?

a   1500 cm^3

b   500 cm^3

c   400 cm^3

d   35 cm^3

19 If the radius of a sphere is tripled, the surface area of the sphere will increase

a   by a factor of 3.

b   by a factor of 4.

c   by a factor of 6.

d   by a factor of 9.

20 A parallelogram is inscribed in a quadrilateral as shown.
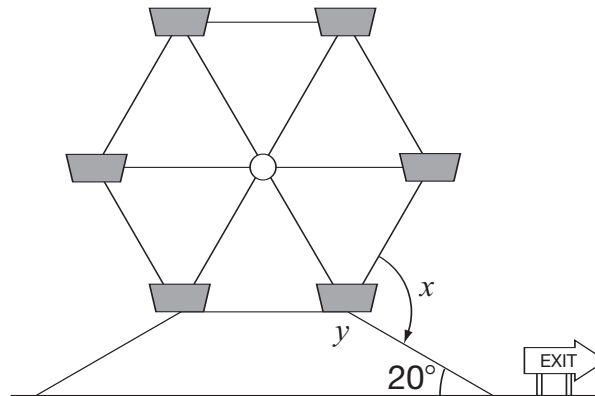

What is the value of x?

a   48°

b   49°

c   83°

d   97°

21   **Wheels of Fun**

A Ferris wheel has six sides of equal length. The exit ramp of the Ferris wheel is in the shape of a trapezoid and has an angle of incline of 20°.

What are the values of x and y?

Use geometric properties to justify your answer.

Sample Assessment Questions: Applied

Answer Key

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

7. (a) (b) (c) ●
8. (a) ● (c) (d)
9. (a) (b) (c) ●
10. (a) (b) (c) ●
11. (a) (b) ● (d)

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

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

End of Assessment

Applied

Grade 9 Assessment of Mathematics

Spring 2008

SAMPLE ASSESSMENT QUESTIONS

Record your answers to the multiple-choice questions on the blank Student Answer Sheet (Spring 2008, Applied).

Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

1 A carton that holds 500 mL of chocolate milk costs $2.29.

Which of the following containers has a lower cost per mL?

  a   250 mL at $1.29

  b   700 mL at $3.09

  c   750 mL at $3.59

  d   1000 mL at $4.69

2 Which of the following fractions is **not** equivalent to $\frac{10}{30}$?

  a $\frac{2}{6}$

  b $\frac{15}{35}$

  c $\frac{1}{3}$

  d $\frac{100}{300}$

3 Aidan is buying a new CD player. The CD player was selling for $84.79 and now is on sale for 25% off. Which of the following is closest to the total cost of the CD player, including 15% sales tax?

  a $54.05

  b $63.59

  c $73.13

  d $74.49

4 What is the value of the expression

$$-1 + \frac{77}{100}?$$

  a $-\frac{177}{100}$

  b $-\frac{78}{100}$

  c $-\frac{76}{100}$

  d $-\frac{23}{100}$

5 A rocket is fired upward from the ground. The equation below shows the relationship between h, the height of the rocket above the ground in metres, and t, the time in seconds.

$$h = 60t - 5t^2$$

Which of the following is the height of the rocket after 4 seconds?

  a   35 m

  b   44 m

  c   160 m

  d   240 m

6 Clarence's Quandary

Clarence works at a veterinarian's office. He needs to give a dose of medicine to a 24 kg dog. The recommended dosage for a dog that weighs 10 kg is 25 mL. Determine the dose Clarence should give to the 24 kg dog if the rate remains the same. Show your work.

7 Mia delivers the local newspaper. Her base pay is $5 per week, and she gets $0.25 per paper.

Pay vs. Number of Papers Delivered
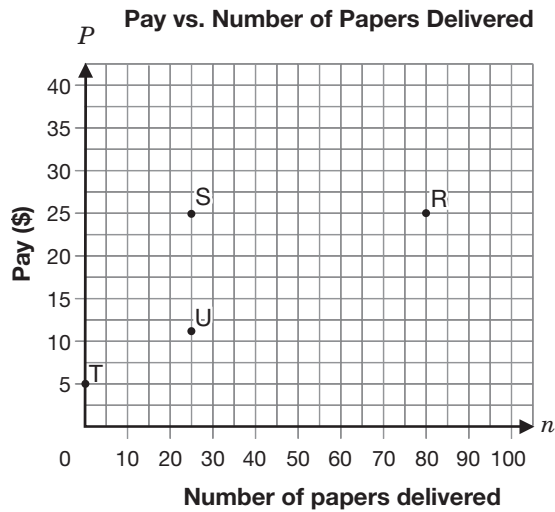
Which of the points on the graph represents Mia's pay for delivering 25 newspapers in a week?

a Point R

b Point S

c Point T

d Point U

8 Yves records the time of day that a street light turns off for 9 mornings over 28 days. The graph shows his data from the first day of the month.

Time vs. Day
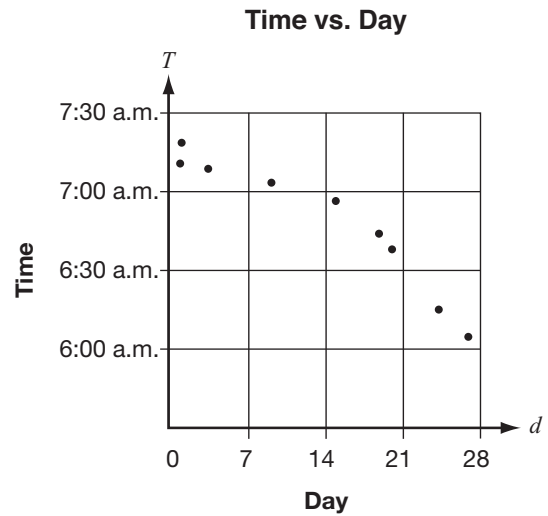
Which statement describes the relation above?

a The later in the month, the later the street light turns off.

b The later in the month, the earlier the street light turns off.

c The earlier in the month, the earlier the street light turns off.

d There is no relationship between the day and the time the street light turns off.

9 Victoria is selling chocolate bars to raise money for her hockey team. She begins with 36 bars to sell and sells four bars per day.

Which of the following represents the relation between N, the number of chocolate bars remaining, and d, the number of days she has been selling?

**a** $N = 36 + 4d$

b $N = 36d - 4$

c

Day, d	Number of bars remaining, N	First differences
0	20	
		4
1	24	
		4
2	28	
		4
3	32	
		4
4	36	

d

Day, d	Number of bars remaining, N	First differences
0	36	
		−4
1	32	
		−4
2	28	
		−4
3	24	
		−4
4	20	

10 Tyler belongs to a fitness club at the community centre. The graph below represents the relationship between the number of times he visits the club and his total monthly cost.

Total Monthly Cost vs. Number of Visits
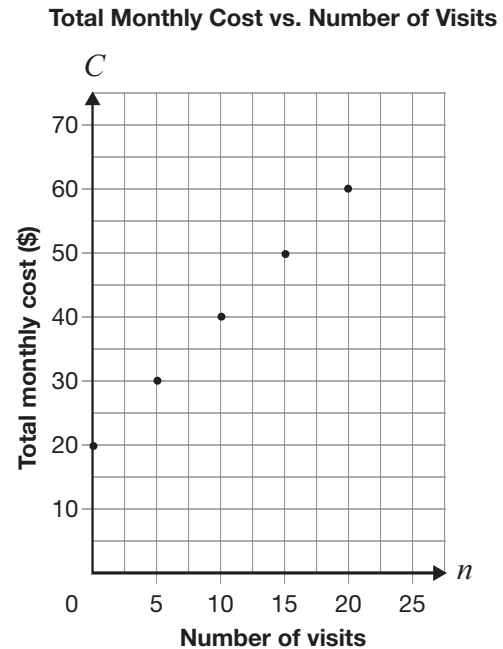
What type of variation is this relationship, and what is the initial value?

a Direct variation, and initial value is 0

b Partial variation, and initial value is 0

c Direct variation, and initial value is 20

d Partial variation, and initial value is 20

11 Karl joins a fitness centre. The cost includes a one-time fee of $100 plus a monthly fee of $30. If C represents his total cost and n is the number of months, which equation represents this relationship?

a $C = 130n$

b $C = 100n + 30$

c $C = 30n + 100$

d $C = n + 130$

12 The relationship between t, the number of minutes Shufrah travels, and D, the distance she is from home, is shown on the grid below.
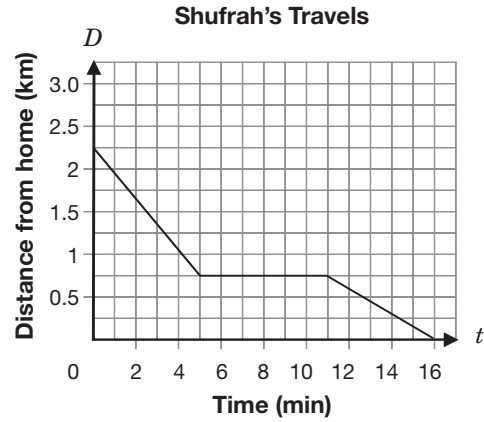
Shufrah's Travels

Which of the following statements best describes the way Shufrah travels?

a While travelling toward her home, Shufrah rides her bike, stops and then walks.

b While travelling toward her home, Shufrah rides her bike, walks and then rides her bike.

c While travelling away from home, Shufrah rides her bike, stops and then walks.

d While travelling away from home, Shufrah walks, rides her bike and then walks.

13 A jewellery store sells bead necklaces. Each necklace costs $4 for the wire and $0.25 per bead.

Select the answer below that represents this relation **correctly** in two ways. C is the cost in dollars and n is the number of beads.
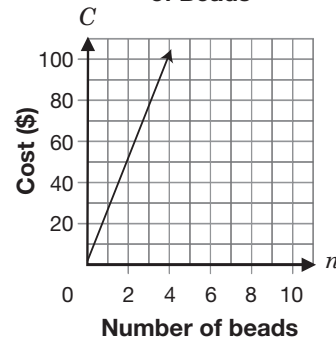
a
Cost vs. Number of Beads
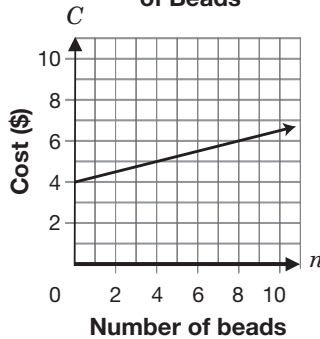
Number of beads, n	Cost, C $
0	0
5	1.25
10	2.50
15	3.75
20	5.00

b $C = 4n + 0.25$

Number of beads, n	Cost, C $
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

c $C = 0.25n + 4$

Cost vs. Number of Beads

d
Cost vs. Number of Beads
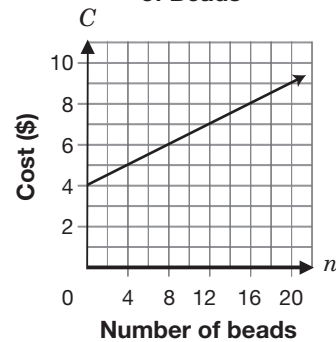
Number of beads, n	Cost, C $
0	4.00
5	5.25
10	6.50
15	7.75
20	9.00

14 U-Rent-Skates charges an $8 fee, plus $3.50 per hour to rent skates.

How long can Zara skate if she has a total of $22 and still needs to keep $1.50 for bus fare?

a 3 hours

b 4 hours

c 5 hours

d 6 hours

15 Starting Costs

A car rental company uses the equation $C = 20 + 0.15d$ to determine the cost of renting a car, where C is the total cost in dollars and d is the distance travelled in kilometres.

Determine the initial value and the rate of change.

Initial value_____

Rate of change_____

Describe how the initial value and the rate of change relate to the total cost of renting a car.

16   Let's Go to a Water Park!

Two water parks have different methods of determining the cost of a season pass. The equations for both parks are given below, where C is the cost of the pass and n is the number of visits.
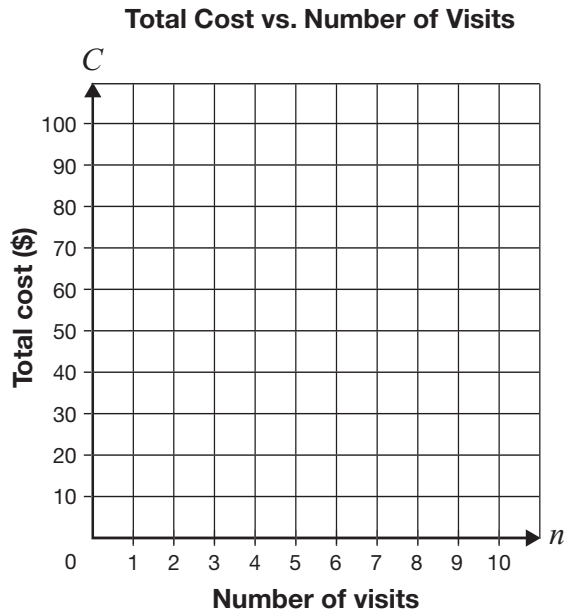
Wet Water World

$C = 20 + 10n$	
Number of visits, n	**Total cost, C ($)**
0	
2	
4	
6	
8	

Bubbling Blue

$C = 50 + 5n$	
Number of visits, n	**Total cost, C ($)**
0	
2	
4	
6	
8	

Graph the costs for both water parks on the grid below.

Total Cost vs. Number of Visits

Determine which water park has the lower cost for a season pass.

Justify your answer.

17 Germaine wants to calculate the area of the shape shown below. It is composed of a rectangle and two semicircles.

Which of the following pairs of expressions should Germaine use to determine the area of the shape?
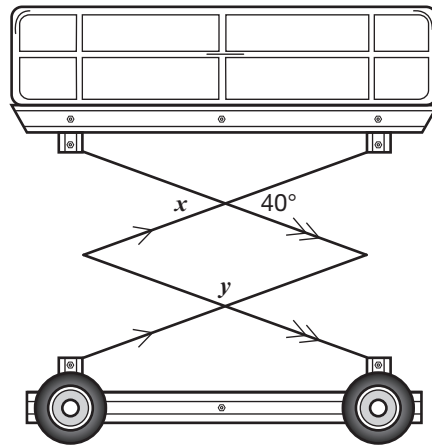
a $2(l + w)$, πr^2

b $2(l + w)$, $2\pi r$

c lw, $2\pi r$

d lw, πr^2

18 Silvia is making lemonade. She is using a cylindrical container with a radius of 10 cm and a height of 30 cm, as shown below.
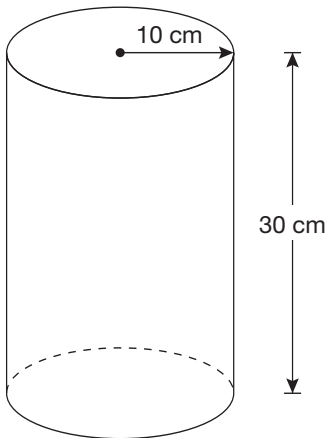
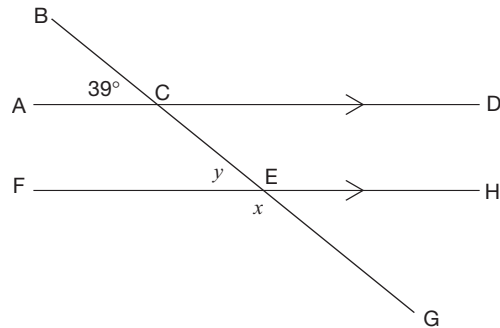Which of the following is closest to the volume of the container?

a   37 700 cm^3

b   9425 cm^3

c   1885 cm^3

d   600 cm^3

19 A custodian uses a lift to change light bulbs in the gym. A cross-section of the lift is shown below.

What are the values of x and y?

a $x = 40°$, $y = 100°$

b $x = 40°$, $y = 140°$

c $x = 50°$, $y = 130°$

d $x = 50°$, $y = 140°$

20 The measure of $\angle ACB$ is 39°.

What are the values of x and y?

a $x = 39°$ and $y = 141°$

b $x = 39°$ and $y = 39°$

c $x = 141°$ and $y = 141°$

d $x = 141°$ and $y = 39°$

21   Determining Degrees

Consider the following diagram.
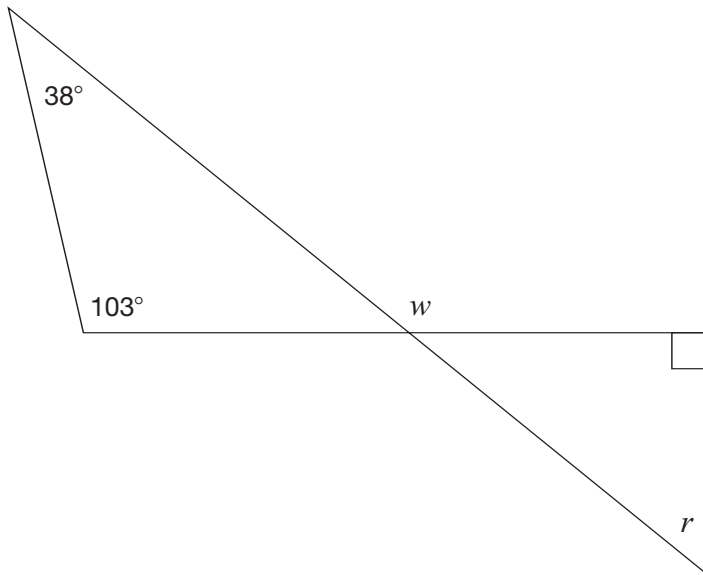
Determine the values of *r* and *w*.

Justify your answer.

	Value	Justification
r		
w		

Sample Assessment Questions: Academic

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. Respond in booklet.

11. **(a)** b c d
12. a **(b)** c d
13. **(a)** b c d
14. a b c **(d)**
15. a b c **(d)**
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