Academic

Grade 9 Assessment of Mathematics

Winter 2009

SAMPLE ASSESSMENT QUESTIONS

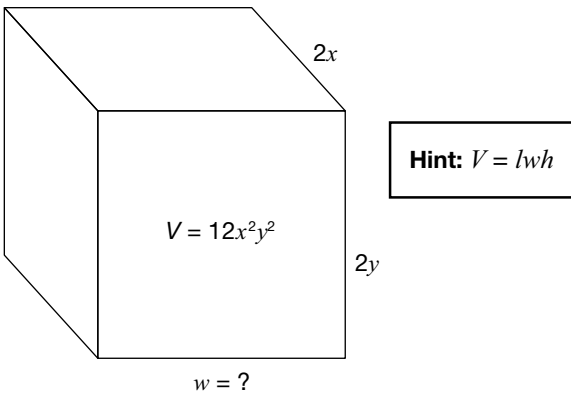**Record your answers to the multiple-choice questions on the blank Student Answer Sheet (Winter 2009, Academic).**

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

1 What is the value of $(x^2)^3$ when $x = \frac{1}{2}$?

a $\frac{1}{4}$

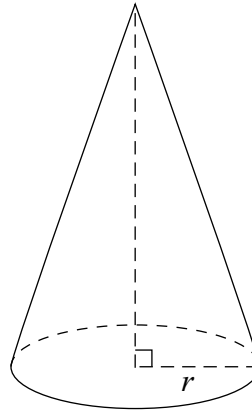b $\frac{1}{12}$

c $\frac{1}{32}$

d $\frac{1}{64}$

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

2x

Hint: $V = lwh$

$V = 12x^2y^2$

2y

w = ?

What is the width of the box?

a $2xy$

b $3xy$

c $4x^3y^3$

d $8x^3y^3$

3 The cone shown below is 20 cm high and has a total volume of 1000 cm^3.

r

Which of the following is closest to the length of the radius, r?

a   6.9 cm

b   6.2 cm

c   4.0 cm

d   2.3 cm

4 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

5 CD Sell-Off

Juan belongs to a CD club that sells CDs for $11.44 each before tax. His first shipment of CDs costs $90.49 including 13% tax.

How many CDs are in his first shipment?

Show your work.

6   Which table of values represents a linear relation?

a

x	y
1	$\frac{1}{3}$
2	$\frac{2}{3}$
3	1
4	$\frac{4}{3}$

b

x	y
0	5
5	7
10	10
15	14

c

x	y
1	2
2	4
3	8
4	16

d

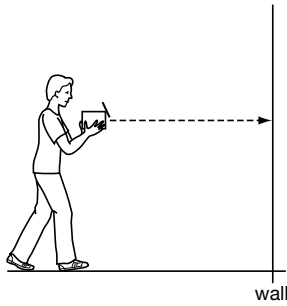| x	y
0	$\frac{1}{2}$
5	$\frac{1}{4}$
10	$\frac{1}{6}$
15	$\frac{1}{8}$

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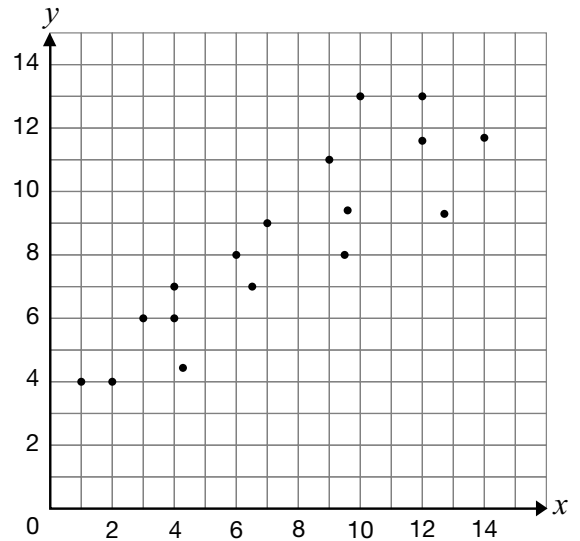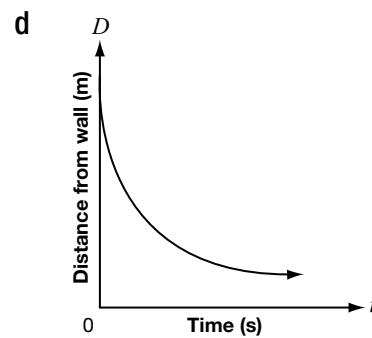

a -2

b -1

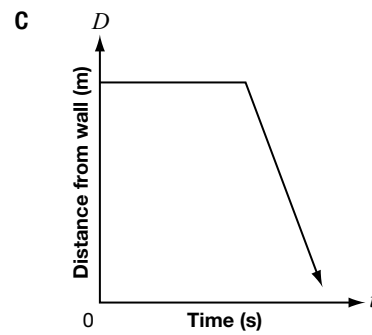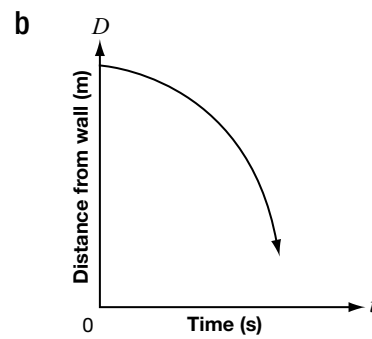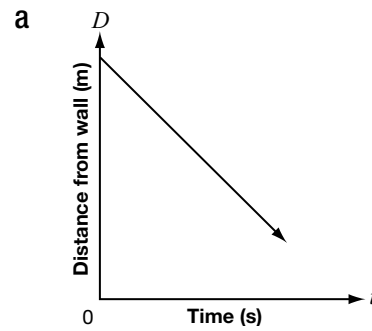**c** 1

d 2

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

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?

a

b

c

d

9 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 $C = 25t + 5$

⑩ **Picture Perfect**

The cost of producing a family photo album is $0.50 per photo, plus a fixed cost for the album.

Circle the table below that represents this scenario.

Option 1

Number of photos, p	Cost, C
5	$2.50
10	$5.00
15	$7.50
20	$10.00

Option 2

Number of photos, p	Cost, C
5	$35.50
10	$36.00
15	$36.50
20	$37.00

Option 3

Number of photos, p	Cost, C
5	$37.50
10	$40.00
15	$42.50
20	$45.00

Justify your choice and include an explanation of why you did not choose the other options.

11 Which of the following statements is true for the line $5x - 2y - 12 = 0$?

a   The slope is $\dfrac{2}{5}$ and the *y*-intercept is 12.

b   The slope is -5 and the *y*-intercept is 6.

c   The slope is 5 and the *y*-intercept is -12.

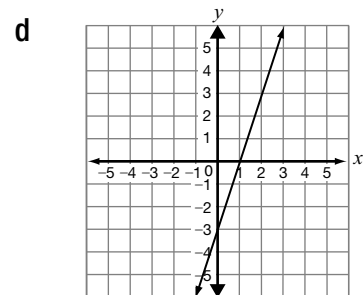d   The slope is $\dfrac{5}{2}$ and the *y*-intercept is -6.
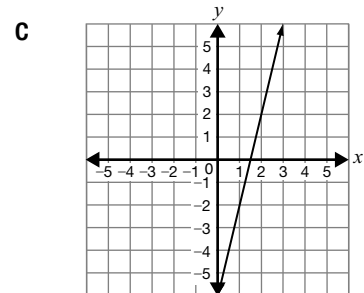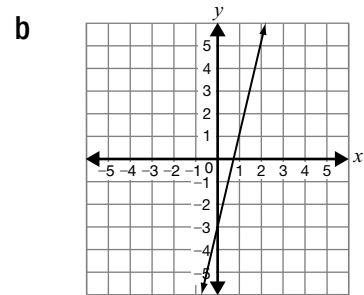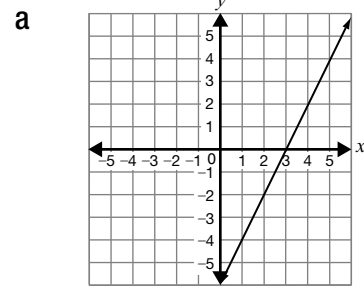
12 For the slope of a line, the change in *x* is greater than the change in *y*. Which of the following could represent the slope of this line?

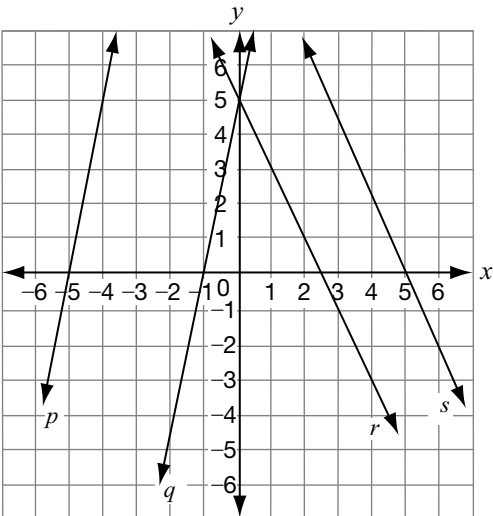a $\dfrac{4}{3}$

b   2

c   1

d $\dfrac{2}{5}$

13 The graph of a line is shown below.
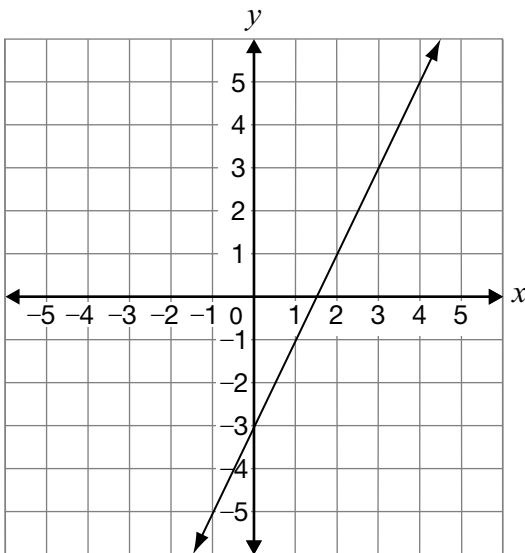
If the slope is doubled and the *y*-intercept remains constant, which graph below best represents the new line?

a

b

c

d

14 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

15 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 $y = \dfrac{4}{3}x - 16$

b $y = \dfrac{4}{3}x - 13$

c $y = \dfrac{3}{4}x - 9$

d $y = \dfrac{3}{4}x - 6$

16   Cellphone Plans

Serge is choosing a cellphone plan and wants the lowest cost. Cell-a-Bration charges $12 per month plus $0.05 per minute for cellphone service. E-Phone charges $28 per month for unlimited minutes.

**Monthly Cost vs.
Number of Minutes**
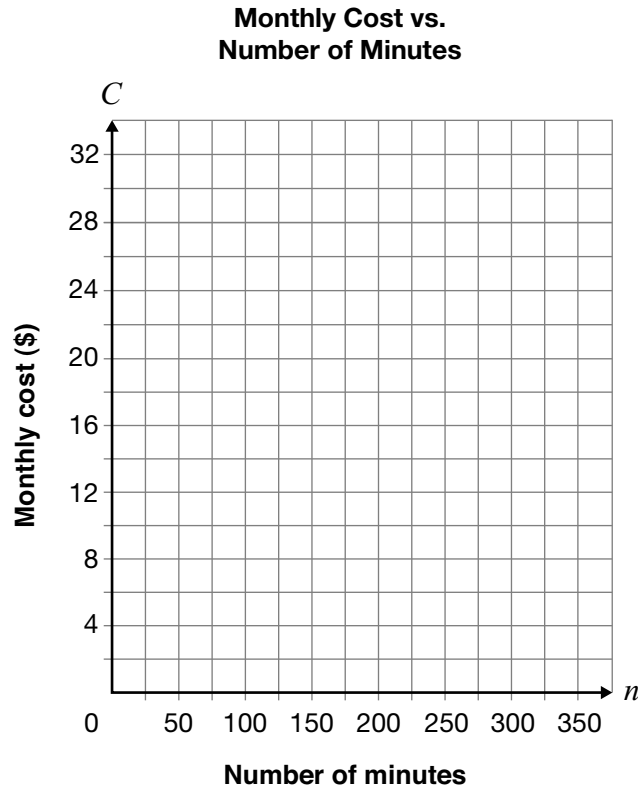
Determine under which conditions Serge should choose Cell-a-Bration and under which conditions Serge should choose E-Phone.
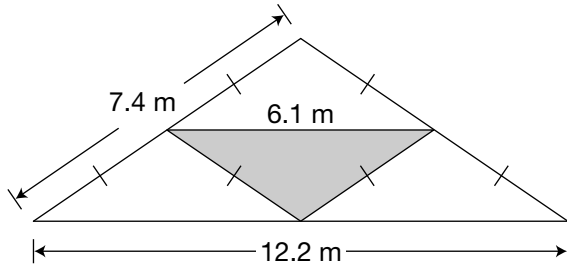
Justify your answer.

17   Triangle KLM is shown below.
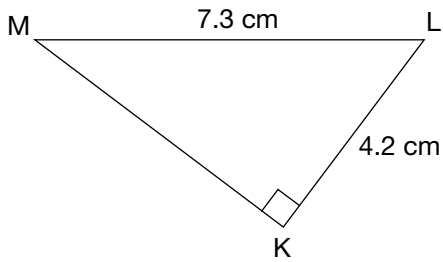
Which of the following is closest to the perimeter of triangle KLM?

a   12.6 cm

b   16.3 cm

c   17.5 cm

d   21.0 cm

18   The frame of the roof of a small house is being constructed. A portion of the frame consists of four isosceles triangles as shown below.

What is the total length of the three sides that form the shaded interior triangle?

a   3.7 m

b   6.1 m

c   13.5 m

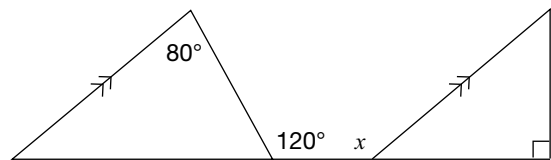d   18.3 m

19   Consider the following diagram.
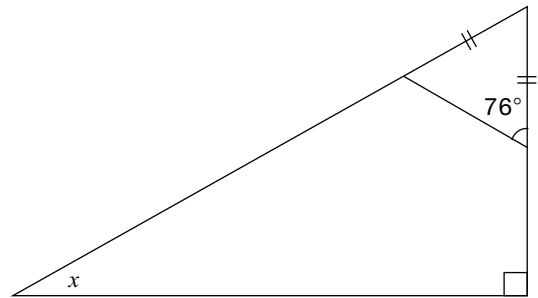
What is the value of x?

a   14°

b   28°

c   62°

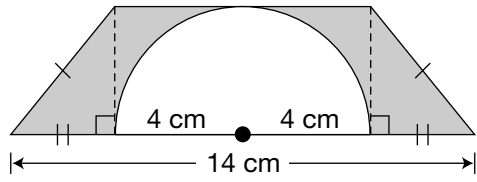d   76°

20   Consider the diagram below.

What is the value of x?

a   80°

b   120°

c   140°

d   170°

21   Something's Missing

The semicircle in the diagram below has a radius of 4 cm.

What is the area of the shaded region?

Show your work.

Grade 9 Assessment of Mathematics
Winter 2009

Sample Assessment Questions: Academic

Answer Key

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

6. ● ⓑ ⓒ ⓓ
7. ⓐ ⓑ ● ⓓ
8. ⓐ ● ⓒ ⓓ
9. ⓐ ⓑ ● ⓓ
10. Respond in booklet.

11. ⓐ ⓑ ⓒ ●
12. ⓐ ⓑ ⓒ ●
13. ⓐ ● ⓒ ⓓ
14. ⓐ ⓑ ● ⓓ
15. ⓐ ● ⓒ ⓓ

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

End of Assessment

Applied

Grade 9 Assessment of Mathematics

Winter 2009
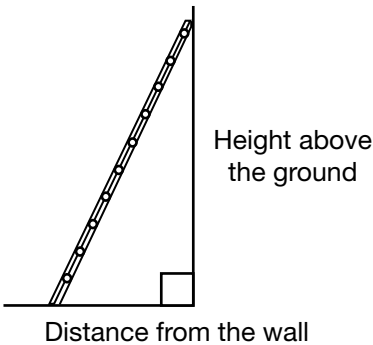
SAMPLE ASSESSMENT QUESTIONS

Record your answers to the multiple-choice questions on the blank Student Answer Sheet (Winter 2009, Applied).

EQAO

1 Sunita places a ladder against a wall. For safety reasons, the ratio of the height above the ground to the distance from the wall should be 5:2.

Height above the ground

Distance from the wall

She places the top of the ladder 6.5 m above the ground. Which of the following is closest to the distance from the wall?

a   2.6 m

b   3.3 m

c   5.4 m

d   16.3 m

2 Paper is sold in different-sized packages. Which package has the lowest cost per sheet?

a $1.00 for 150 sheets

b $1.20 for 200 sheets

c $2.50 for 500 sheets

d $5.50 for 1000 sheets

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

x

$2x$
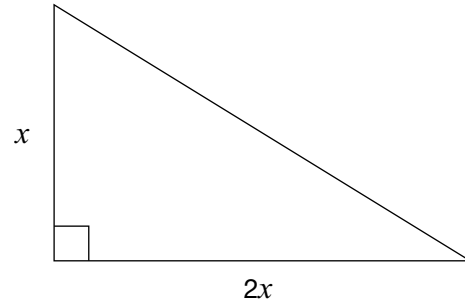
If the area is 25 square units, what are the dimensions of the shorter sides?

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

a   1, 2

b   1, 3

c   5, 5

d   5, 10

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

a $3x - 2$

b $3x + 2$

c $-3x - 2$

d $-3x + 2$

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

a   2

b   3

c   5

d   6

6 Jobs

Peter has two part-time jobs. His earnings for one week are represented by the equation below:
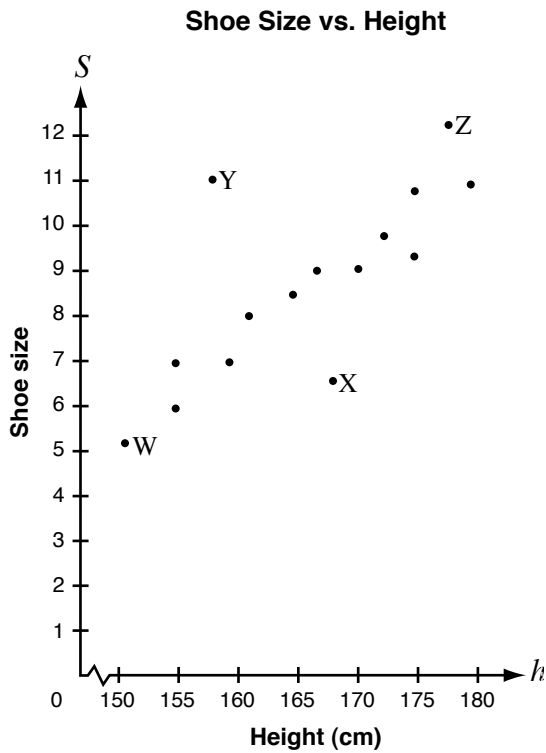
$$E = 7.50r + 8.25v$$

- E is his total earnings in one week;

- r is the number of hours he works at the restaurant and

- v is the number of hours he works at the video store.

Peter earns a total of $117.75 in one week. If he works 8 hours at the restaurant, how many hours does he work at the video store?

Show your work.

7 The graph shows the shoe sizes of girls of various heights.
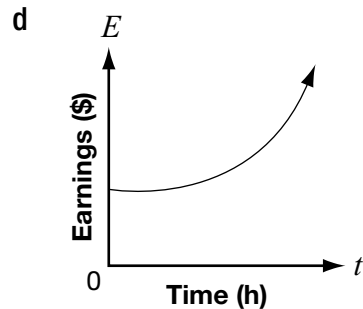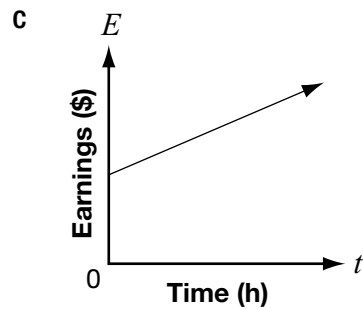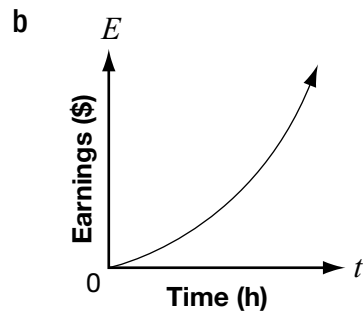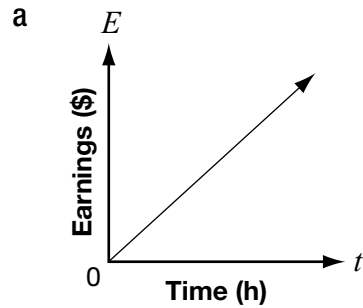
Shoe Size vs. Height

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

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?

a

b

c

d

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.

Income vs. Time Worked
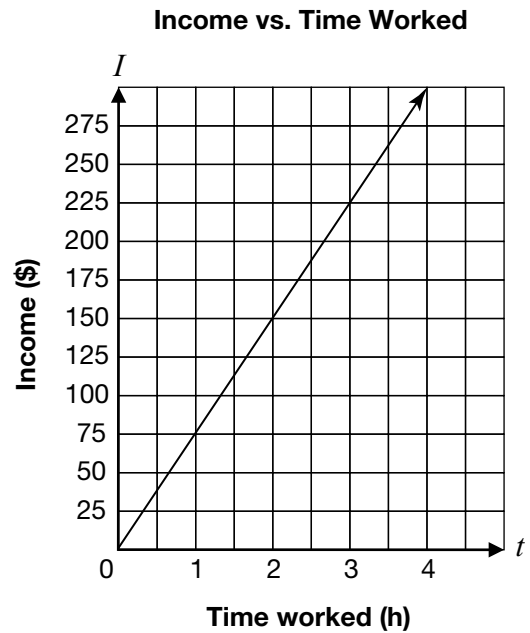
What is Joe's hourly rate?

a $25/hour

b $75/hour

c $150/hour

d $225/hour

11 A banquet hall charges a $1500 rental fee, plus $25 per person.

Which table below shows this relation?

a   **Banquet Charges**

Number of people	Total cost ($)
0	1500
5	1525

b   **Banquet Charges**

Number of people	Total cost ($)
0	1500
5	3000

c   **Banquet Charges**

Number of people	Total cost ($)
5	125
250	6250

d   **Banquet Charges**

Number of people	Total cost ($)
5	1625
250	7750

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?

a

b

c

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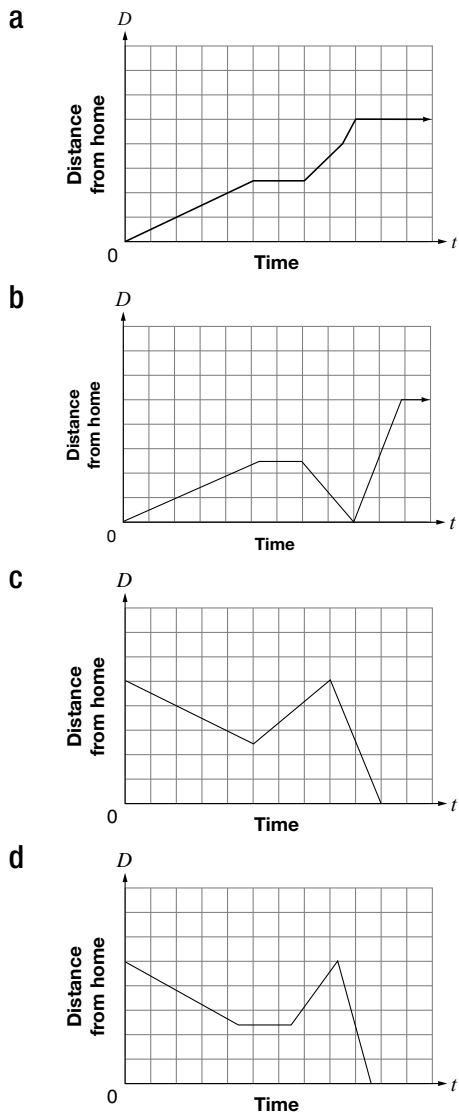
14 The data for five isosceles triangles with perimeters of 24 cm are shown below.

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?

a

b

c

d
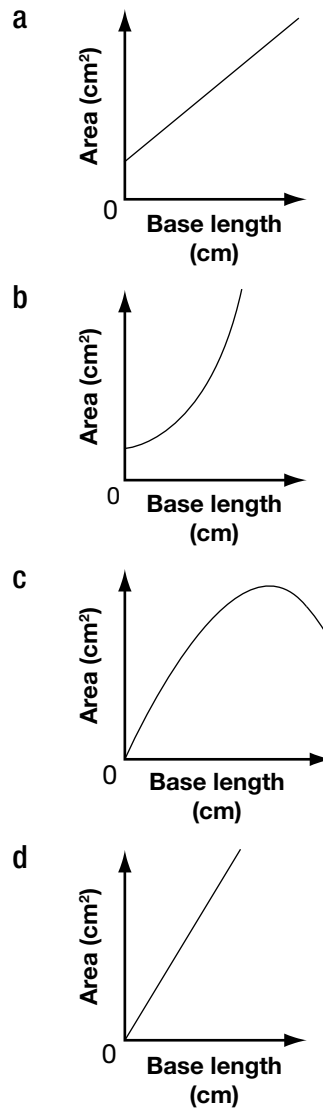
15 Poster Printing

The total cost to print posters includes a set-up fee plus a charge per poster. The graph below represents the relationship between C, the total cost, and n, the number of posters printed.

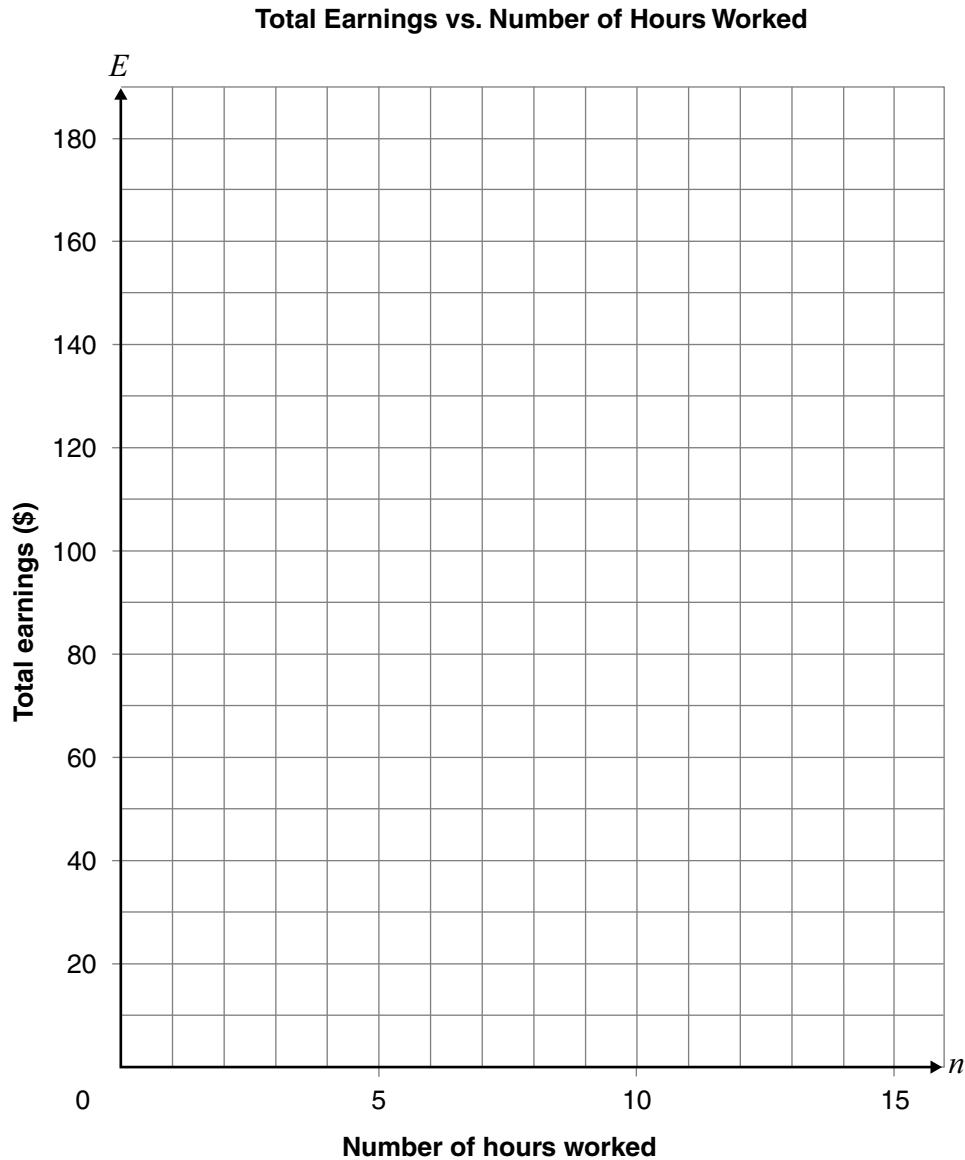**Total Cost vs. Number of Posters**
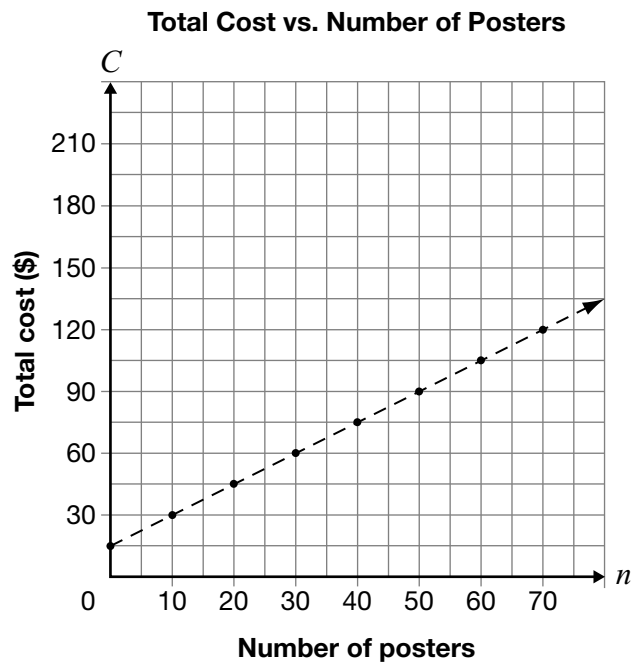
Determine the charge per poster.

Show your work.

16 Part-Time Jobs

Liz's new job offers a one-time bonus of $30 and an hourly pay rate of $10 per hour. Alex has a new job that pays $15 per hour.

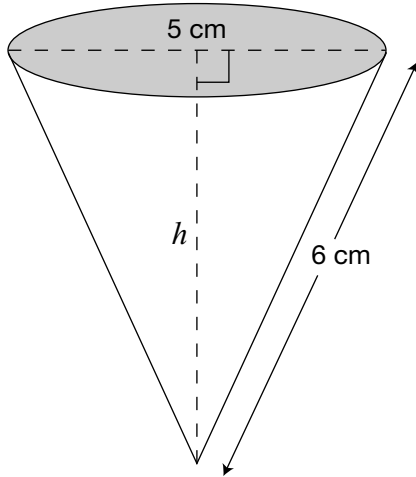Graph each person's total earnings on the grid below. Label each line.

Total Earnings vs. Number of Hours Worked

E

Total earnings ($)

180
160
140
120
100
80
60
40
20

0   5   10   15 n

Number of hours worked

Determine where the lines intersect.

The lines intersect at _____.

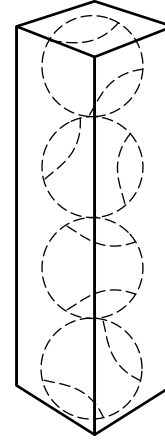What does this point represent?

17 A cone-shaped water cup is shown below.

5 cm

h

6 cm

Which of the following is closest to the height of the cup, *h*?
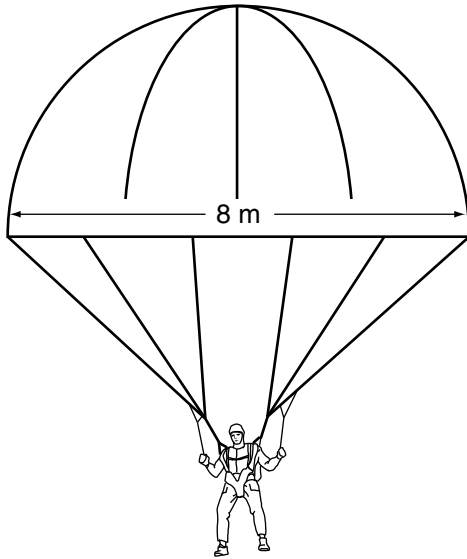
a   3.3 cm

b   3.5 cm

c   5.5 cm

d   8.5 cm

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 cm × 5 cm × 20 cm

b   5 cm × 5 cm × 40 cm

c   10 cm × 10 cm × 10 cm

d   10 cm × 10 cm × 40 cm

19 A fully opened parachute is shaped like a hemisphere and has a diameter of 8 m, as shown below.

8 m

Which of the following is closest to the volume of air that can fit in the fully opened parachute?

a   134 m^3

b   268 m^3

c   1072 m^3

d   2145 m^3

20 What is the value z in the diagram below?
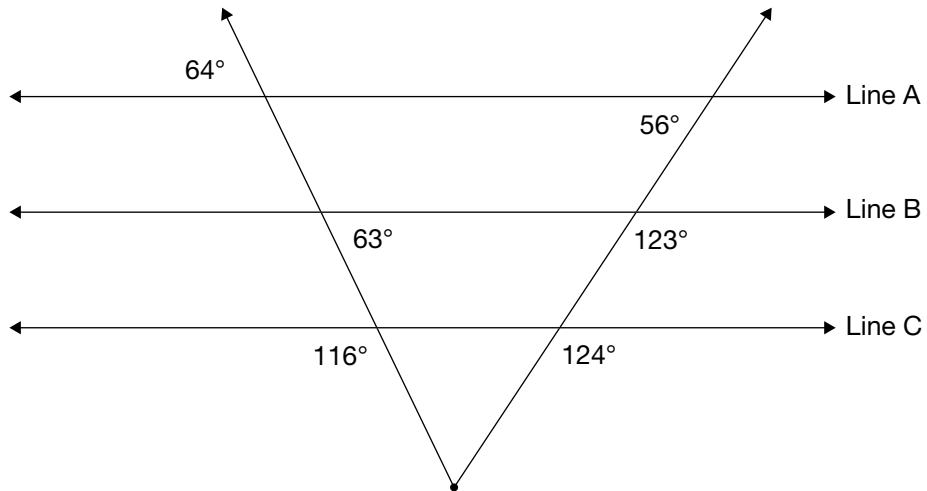

z
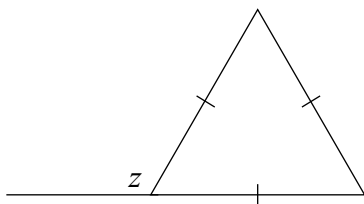
a   60°

b   100°

c   120°

d   140°

21 **Parallel Illusions**

Often lines that look parallel are not parallel.

Which two lines in the diagram above are parallel?

Justify your answer using geometric properties.

Sample Assessment Questions: Applied

Answer Key

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

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

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

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

End of Assessment