Grade 9 EQAO Booklet

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

2x

Hint: $V = lwh$

$V = 12x^2y^2$

2y

$w = ?$
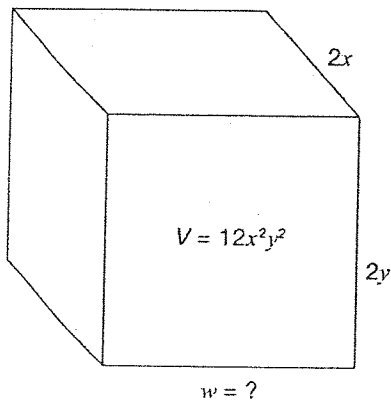
What is the width of the box?
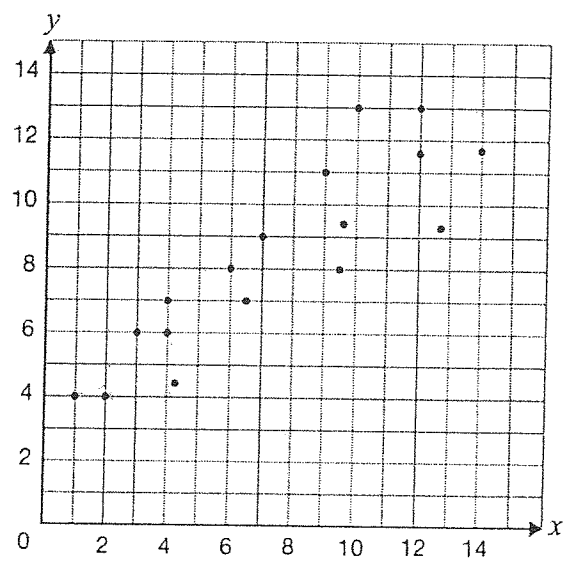
a $2xy$

b $3xy$

c $4x^3y^3$

d $8x^3y^3$

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

a $x = -2$

b $y = 3x - 1$

c $y = x^2 + 3$

d $3x - 2y - 1 = 0$
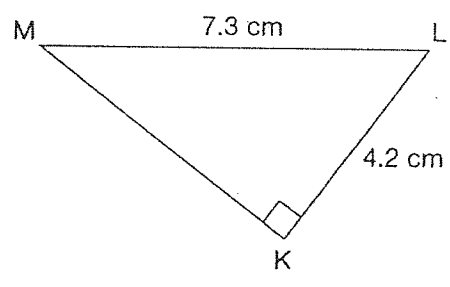
3)

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

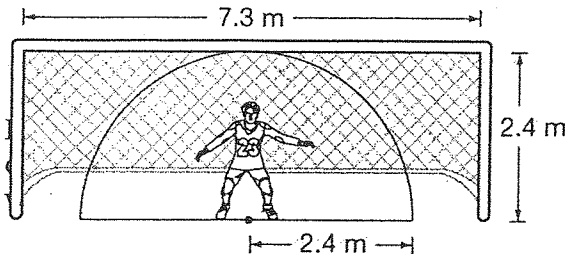D 2

4) Triangle KLM is shown below.

M   7.3 cm   L

4.2 cm

K

Which of the following is closest to the perimeter of triangle KLM?
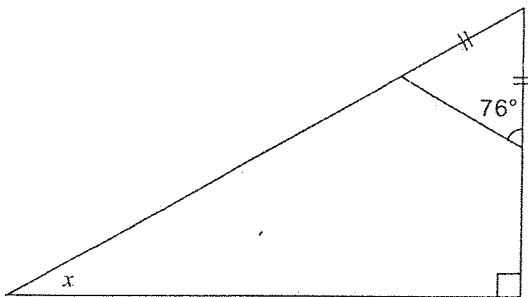
a   12.6 cm

b   16.3 cm

c   17.5 cm

d   21.0cm

5) A soccer goalie is standing in a goal opening. From this position, she can guard the area represented by the semicircle below.

uch 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
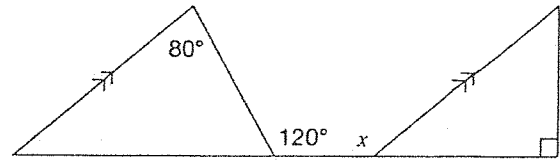
6) Consider the following diagram.

What is the value of x?

a $14°$

b $28°$

c $62°$

d $76°$

7) Consider the diagram below.

What is the value of x?

a $80°$

b $120°$

c $140°$

d $170°$

8)

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 $y = \frac{3}{4}x - 6$

9)

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 $8x + 11$

10)

The expression below can be simplified.
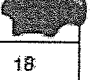
$$\frac{(x^2y)^3}{(xy)^2}$$

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

a x^4y

b x^4

c xy

d x^3y

11)

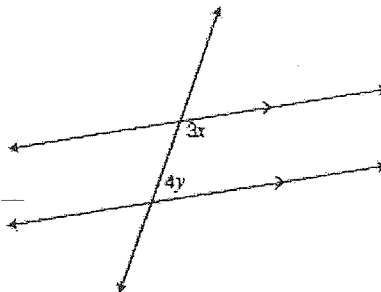Gerry has a table of values representing a linear relation. Two of the numbers are hidden behind a ketchup spill.

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.

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)

What is the equation of the line that passes through the points $(2, 4)$ and $(4, 0)$?

a $y = -\frac{1}{2}x + 2$

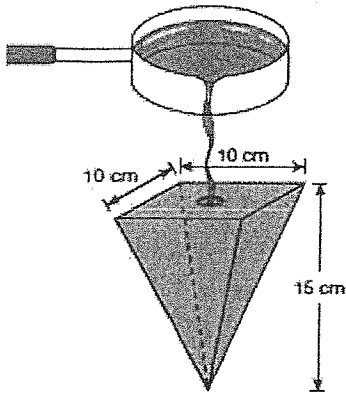b $y = -\frac{1}{2}x + 5$

c $y = -2x + 4$

d $y = -2x + 8$

14)

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.

15)

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

17)

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

16)
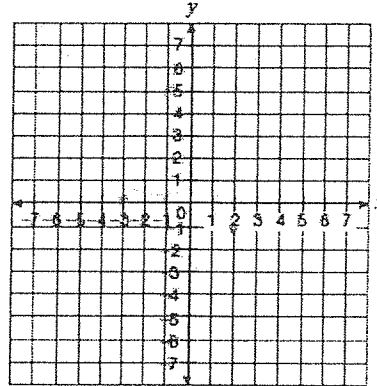
How would the graph of the relation $y = 3x - 2$ change if the 3 and −2 were both doubled?

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.

18)

A parallelogram is inscribed in a quadrilateral as shown.
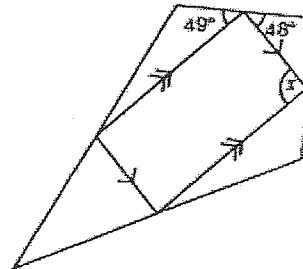
What is the value of x?

a   48°

b   49°

c   83°

d   97°

19)

Meg has been asked to determine the value of the numerical expression below.
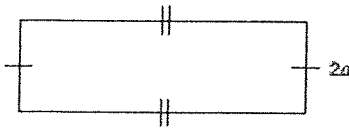
$$\frac{2^{400}}{2^{396}} - 2^3$$

Which of the following is the value of Meg's expression?

A   1

B   2

C   4

D   8

20)

A rectangular field has a **perimeter** of $(10a - 6)$ metres and a width of $2a$ metres.

Which expression represents the length of this field?

A $8a - 6$

B $12a - 6$

C $3a - 3$

D $3a^2 - 3$
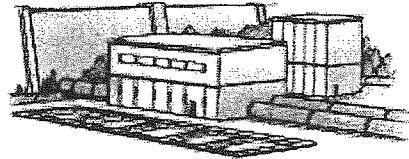
21)

Which value of x satisfies the equation $5 - 2x = 9$?

F $x = -7$

G $x = -2$

H $x = 2$

J $x = 3$

22)

The charges on a monthly water bill are $0.86 per m^3 of water used plus a service charge of $4.49.

Let C = total charge, in dollars, and
w = total amount of water used, in m^3.

Which equation represents the relationship between C and w?

F $C = 4.49 \times 0.86w$

G $C = 4.49w + 0.86$

H $C = 4.49 + 0.86w$

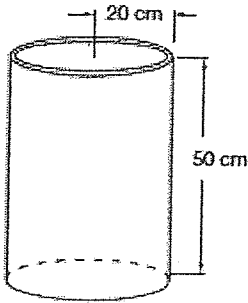J $C = (4.49 + 0.86)w$

23)

A line has the following characteristics.

• It is perpendicular to the line
$y = \frac{1}{2}x + 3$.

• It passes through the point $(4, 0)$.

What are m, the slope, and b, the y-intercept, of the line?

A $m = \frac{1}{2}; b = 0$

B $m = \frac{1}{2}; b = 3$

C $m = -2; b = 0$

D $m = -2; b = 8$

24)

Brad has a cylindrical metal container that is open at the top. He wants to paint the outer surfaces of the container, including the bottom.
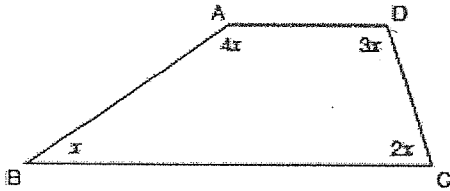

Which expression should he use to calculate the area to be painted?

A $\pi(20)(50)$ cm^2

B $2\pi(20)(50)$ cm^2

C $2(\pi(20)^2 + \pi(20)(50))$ cm^2

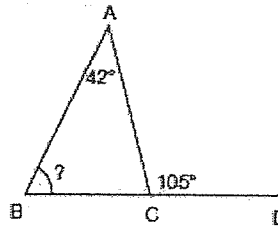D $(\pi(20)^2 + 2\pi(20)(50))$ cm^2

25)

ABCD is a quadrilateral.

What is the measure of ∠BAD?

F   108°

G   120°

H   132°

J   144°

26)

In the figure, BC is extended to D. ∠BAC = 42° and ∠ACD = 105°.

What is the value of ∠ABC?

A   33°

B   42°

C   52°

D   63°

27)

Alex's Rose Shop makes up bouquets and charges for the vase, plus a cost per rose.

• The shop charges $32.85 for a bouquet of 12 roses.

• The shop charges $50.85 for a bouquet of 20 roses.

What does Alex's Rose Shop charge for a vase?

A $18.00

B $8.00

C $5.85

D $2.74

28)

Which of the following fish tanks would contain an amount of water represented by the expression $V = 24x^2y$ when completely full?

A

$4x$, $3y$, $2y$

B

$6x$, $4x$, y

C

$8x$, $8y$, $8y$

D

$8x$, $12x$, $3y$
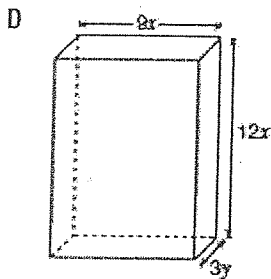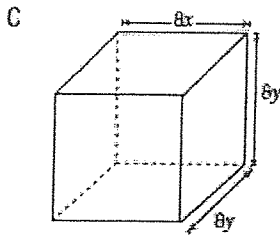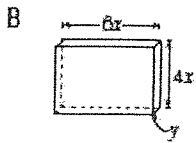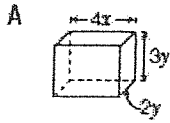
29)

Salazar is asked to graph the linear relation represented by $2x - 3y + 6 = 0$. What is the y-intercept of this line?

A −6

B −2

C 2

D 6

30)

Temira needs to rent a car. She considers the following price equations, where C is the total cost, in dollars, and n is the number of days.
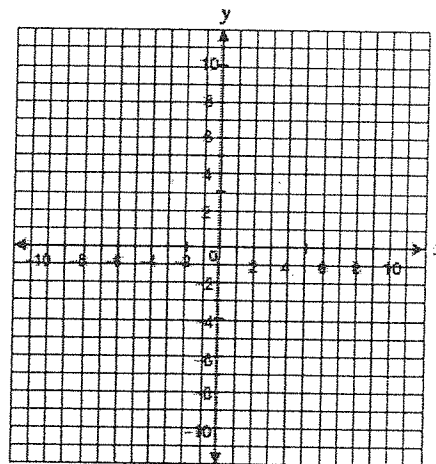
Company	Equation
Rentway	$C = 20n + 100$
Cheapie's Rentals	$C = 25n + 50$
Cars Cars Cars	$C = 50n$
Drive Away	$C = 15n + 125$

Which company should she choose if she is planning to rent the car for at least 10 days?

F   Rentway

G   Cheapie's Rentals

H   Cars Cars Cars

J   Drive Away

31)

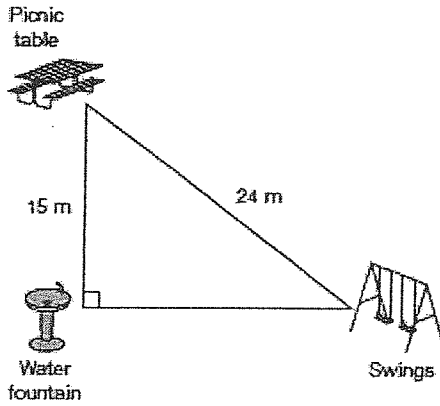Imagine the graph for the relation $4x - 5y + 20 = 0$.

What is the slope?

F $\frac{4}{5}$

G $-\frac{4}{5}$

H $\frac{5}{4}$

J   4

32)

The positions of the water fountain, the picnic table and the swings at a local park are shown below.

Picnic table

15 m

24 m

Water fountain

Swings

The Pythagorean theorem was used to determine the distance, in metres, from the water fountain to the swings. Which of the following is closest to this distance?

A   28 m

B   19 m

C   15 m

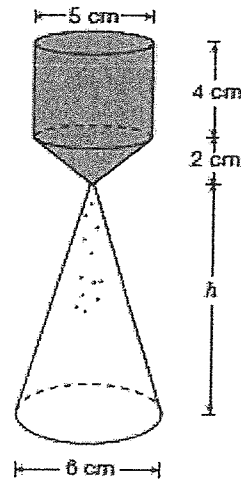D   9 m

33)

If $x = 3$, what is the value of $2x^2 + 5x$?

a   21

b   27

c   33

d   51

34)

Sand is being poured from one container to another, as shown below. The sand flows from the shaded part to the unshaded cone.

├─5 cm─┤

4 cm

2 cm

h

├─ 6 cm ─┤

The shaded part starts full of sand. The sand empties into the unshaded cone and fills it to the top. What is the height of the unshaded cone?

F   6.0 cm

G   8.3 cm

H   9.7 cm

J   12.5 cm

35)

How many of these equations represent straight lines?

$y = x - 2$

$y = 2 - 4x$

$y = x^{-}$ }

a   one

b   two ·

c   three

d   none
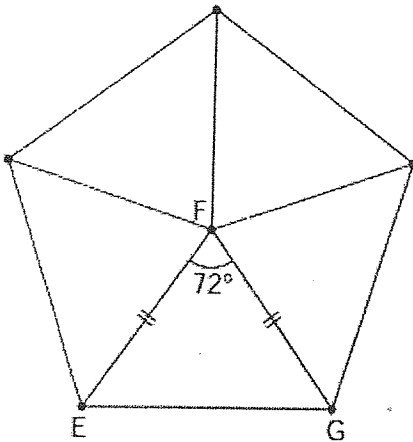
36)

Rearrange $4y - x = 8$ so that it is in the form $y = mx + b$.

a $y = x + 8$

b $y = -x + 2$

c $y = \frac{1}{4}x + 2$

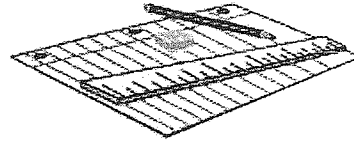d $y = -\frac{1}{4}x + 2$

37)

Examine the figure below.

What is the measure of $\angle FEG$?

a $36°$

b $54°$

c $60°$

d $72°$

38)

Sabeeta expands and simplifies the expression below.

$$2(3x^2 - 5x) + 4x(7 + x)$$

Which expression is equivalent to the one above?

a $6x^2 + 22x$

b $10x^2 + 18x$

c $10x^2 - 38x$

d $28x^2$

39)

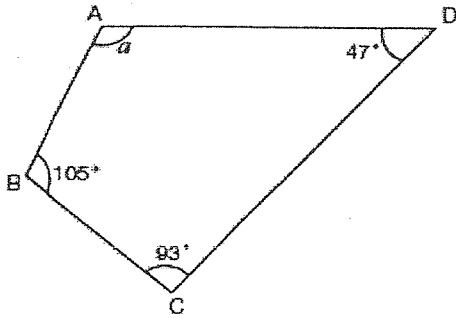Kaya works as a translator. She charges 21¢ for each word she translates.

Which expression should Kaya use to calculate her charge, in dollars, for translating a document with n words?

a $\$\frac{21 \times n}{100}$

b $\$\frac{100}{21 \times n}$

c $\$\frac{n}{21 \times 100}$

d $\$\frac{21 \times 100}{n}$

40)

ABCD is a quadrilateral.
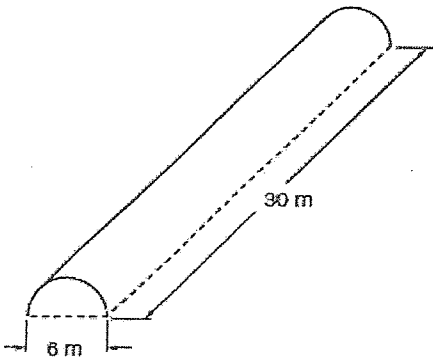

What is the value of *a*?

a   105°

b   115°

c   120°

d   125°

41)

The figure shows a greenhouse roof in the shape of half a cylinder.

What is the approximate surface area of the curved roof?

a   283 m^2

b   424 m^2

c   565 m^2

d   848 m^2

42)

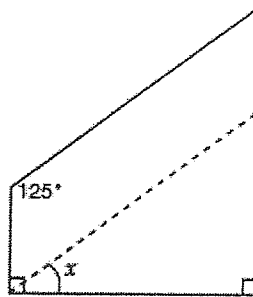The average temperature during 10 days in March is given by the expression

$$\frac{6(-2) - 5 + 3(-1)}{10}$$

What is the value of the expression?

a   2

b   1

c   −1

d   −2

43)

Teresa needs to cut a piece of wood in order to make a parallelogram. She marks a line on the wood where she will cut.
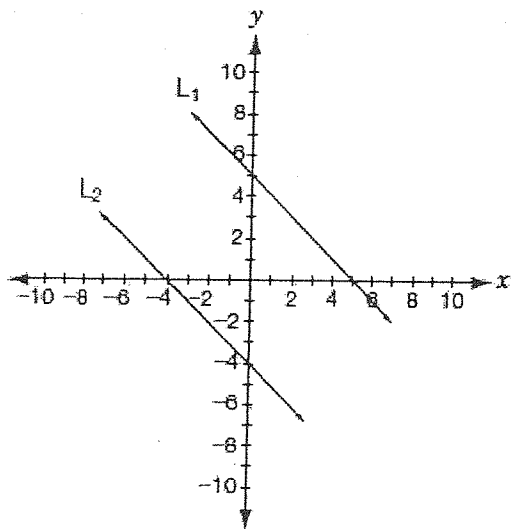

What is the size of angle *x*?

a   25°

b   35°

c   45°

d   55°

44)

Which pair of equations best matches the lines shown on the graph?

a $\quad L_1: y = x + 5$
$\quad\quad L_2: y = x - 4$

b $\quad L_1: y = x + 5$
$\quad\quad L_2: y = {}^-x + 4$

c $\quad L_1: y = {}^-x + 5$
$\quad\quad L_2: y = x - 2$

d $\quad L_1: y = {}^-x + 5$
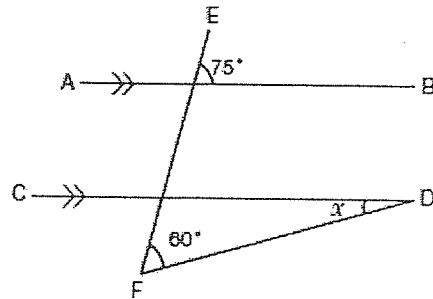$\quad\quad L_2: y = {}^-x - 4$

45)

Given A (2, 5) and B (−6, 5), which statement about the line segment AB is true?

F $\quad$ The slope of AB is zero.

G $\quad$ The slope of AB is positive.

H $\quad$ The slope of AB is negative.

J $\quad$ The slope of AB is undefined.

46)

What is the value of x?

A $\quad$ 15°

B $\quad$ 30°

C $\quad$ 45°

D $\quad$ 60°

47)

A basketball has a radius of 12 cm.
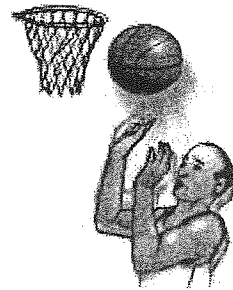
What is its surface area, correct to the nearest square centimetre?

A $\quad$ 450 cm^2

B $\quad$ 1810 cm^2

C $\quad$ 5429 cm^2

D $\quad$ 7238 cm^2

48)

Tim shows the steps he took in simplifying the following algebraic expression:
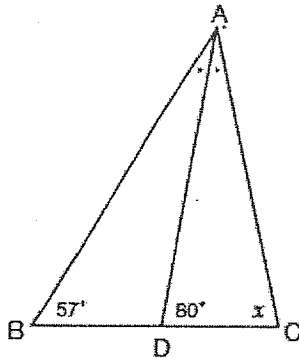
$$\frac{(a^2)^3}{a^2 \times a^3}$$

$$= \frac{a^5}{a^2 \times a^3} \qquad \text{Step 1}$$

$$= \frac{a^5}{a^{2+3}} \qquad \text{Step 2}$$

$$= \frac{a^5}{a^5} \qquad \text{Step 3}$$

$$= 1 \qquad \text{Step 4}$$

In which step did Tim make an error?

F   Step 1

G   Step 2

H   Step 3

J   Step 4

49)

AD is the angle bisector of ∠BAC.
∠ABD = 57° and ∠ADC = 80°.
What is the value of angle x?

F   50°

G   57°

H   70°

J   77°

50)

Nicole measures the heights of children at a child care centre and finds that the height of a child increases non-linearly as the child's age increases.

Which graph represents Nicole's findings?

A

B

C

D