

EQAO Sample Questions:

1. What is the value of $6x^2$ when $x = \frac{1}{3}$?

a $\frac{2}{9}$
 b $\frac{2}{3}$ - $= 6\left(\frac{1}{3}\right)^2$
 $= 6\left(\frac{1}{9}\right)$
 $= \frac{6}{9}$
 $= \frac{2}{3}$
 c 2
 d 4

See 1-1

2. Which value of x satisfies the equation

$5 - 2x = 9$?
 a $x = -7$ - $-2x = 9 - 5$
 $-2x = 4$
 $\frac{-2x}{-2} = \frac{4}{-2}$
 $x = -2$
 b $x = -2$
 c $x = 2$
 d $x = 3$

See 1-4

3. Consider the expression below.

$3x^2(5x^2 - 2x + 1)$

Which of the following is equivalent to this expression?

a $8x^2 - 2x + 1$
 b $8x^2 + x + 4$
 c $15x^4 - 2x + 1$
 d $15x^4 - 6x^3 + 3x^2$

See 1-2

4. The sum of the perimeters of two shapes is represented by $13x + 4y$. The perimeter of one shape is represented by $4x - 2y$. Which expression represents the perimeter of the other shape?

a $9x + 2y$
 b $9x + 6y$
 c $17x + 2y$
 d $17x + 6y$

$13x + 4y - (4x - 2y)$
 $= 13x + 4y - 4x + 2y$
 $= 9x + 6y$

See 1-2

5. Which of the following is equivalent to the expression below?

$(4x - 5) + (2x + 1)$

a $2x - 6$
 b $2x - 4$
 c $6x - 6$
 d $6x - 4$

See 1-2

6. 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

$(15 \times 55) + (20 \times 60) - 220 - 160$

See 1-4

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

- a $\frac{1}{4} = 2^b$
 b $\frac{1}{12} = (\frac{1}{2})^b = \frac{1^b}{2^b}$
 c $\frac{1}{32} = \frac{1}{2^b}$
 d $\frac{1}{64} = \frac{1}{64}$

See 1-1

8. Meg has been asked to determine the value of the numerical expression below.

$$\frac{2^{400}}{2^{396}} - 2^3 \quad 2^4 - 2^3$$

$$16 - 8$$

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

- a 1
 b 2
 c 4
 d 8

See 1-1

8. Part-Time Job

Ezre works part-time at a clothing store. He earns \$80 per week plus 6% of the value of his weekly sales. This week Ezre earns \$119. What is the total value of his sales this week? Show your work

Let w represent his weekly sales
 Let E represent the total earnings

$$E = 80 + 0.06w$$

$$119 = 80 + 0.06w$$

$$119 - 80 = 0.06w$$

$$39 = 0.06w$$

$$w = 650$$

See 1-4

∴ his weekly sales was \$650.

10. 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.

1267 pop tabs = 1 lb

← Conversions → 1 kilogram = 2.2 pounds

$$\frac{1267 \text{ pop tabs}}{1 \text{ lb}} \times \frac{2.2 \text{ lbs}}{1 \text{ kg}}$$

$$= 2787.4 \text{ pop tabs / kg}$$

HINT:

See 1-4

$$\text{Total Cost} = \text{Cost/kg} \times \# \text{ of kg}$$

$$1500 = \$0.88/\text{kg} \times k$$

$$\frac{1500}{0.88} = k$$

$$1704.54 = k$$

kg

∴ If 1704.54 kg of pop tabs are required, there are 2787.4 pop tabs per kg, then:

$$1704.54 \times 2787.4$$

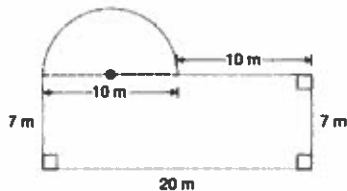
$$= 4751250 \text{ pop tabs are required}$$

EQAO Sample Questions:

1. A garden is in the shape of a rectangle and a semicircle as shown below.

Which of the following is closest to the amount of fencing needed to enclose the garden?

- a 60 cm
b 70 cm
c 75 cm
d 85 cm



See 2-2

2. Ella wants a rectangle with:

- a perimeter of 100 cm and
- the largest possible area.

What are the dimensions of the rectangle that satisfies her conditions?

- a 10 cm x 10 cm
b 20 cm x 30 cm
c 25 cm x 25 cm
d 40 cm x 60 cm

$$S = \frac{P}{4}$$

$$= \frac{100}{4}$$

$$S = 25$$

See 2-2

3. Chris has a square garden with an area of 38.4 m^2 , as shown in the diagram.



He decreases the length of each side by 1.7m to make a smaller garden. Which is the closest to the perimeter of the smaller garden?

- a 37 m
b 32 m
c 25 m
d 18 m

$$A = s^2$$

$$38.4 = s^2$$

$$\sqrt{38.4} = s$$

$$6.20 = s$$

new length

$$= 6.20 - 1.7$$

$$= 4.50$$

See Formula Sheet

$$P = 4s$$

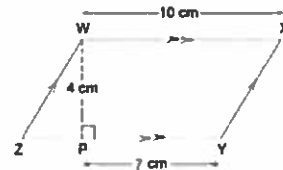
$$= 4(4.50)$$

$$= 18$$

16

4. Consider the parallelogram shown below. What is the perimeter of WXYZ?

- a 28 cm
b 30 cm
c 31 cm
d 34 cm



See 2-1

5. Consider the diagram below.



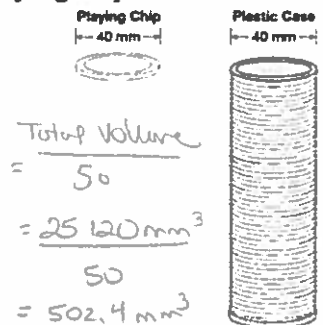
- a 55°
b 70°
c 125°
d 130°

See 2-4

6. The playing chips of a board game are stored in cylindrical plastic cases. The plastic cases have a volume of 25120 mm^3 and a diameter of 40 mm. Which of the following is closest to the height of one playing chip if 50

playing chips can fit tightly into the plastic case as shown above?

- a 0.1 mm
b 0.4 mm
c 1.3 mm
d 2.5 mm



$$\text{Total Volume} = 50$$

$$= \frac{25120 \text{ mm}^3}{50}$$

$$V_{\text{chip}} = 502.4 \text{ mm}^3$$

$$V_{\text{cylinder}} = \pi r^2 h$$

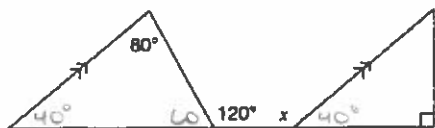
$$\frac{V}{\pi r^2} = h$$

$$\frac{502.4}{\pi (20)^2} = h$$

$$0.4 \text{ mm} = h$$

See 2-3

7. Consider the following diagram.



What is the value of x ?

- a 80°
- b 120°
- c 140°
- d 170°

Sec 2-4 & 2-5

8. What is the sum of the interior angles of a 12-sided regular polygon?

- a 1080°
- b 1800°
- c 1980°
- d 2160°

$$S = 180(n-2)$$

$$= 180(12-2)$$

$$= 1800^\circ$$

Sec 2-6

9. Toy Sailboats

Emelina makes toy sailboats as shown below. Determine the total area of the shaded sails. Show your work

$$a^2 + b^2 = c^2$$

$$h^2 + 4^2 = 11^2$$

$$h^2 = 121 - 16$$

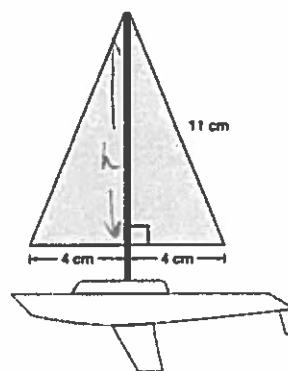
$$h^2 = 105$$

$$h = 10.25 \text{ cm}$$

$$A_{\text{sail}} = \frac{bh}{2}$$

$$= \frac{8(10.25)}{2}$$

$$= 41 \text{ cm}^2$$



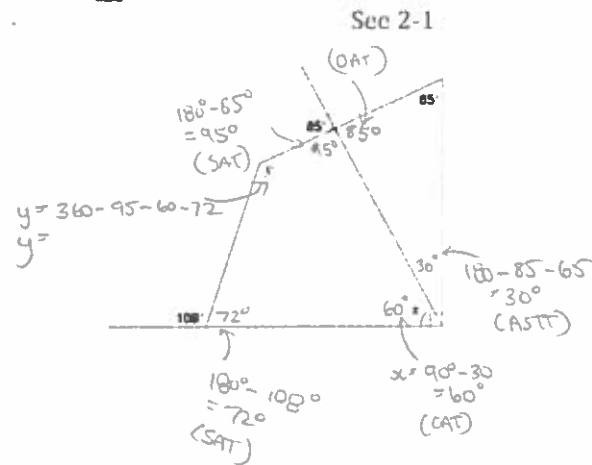
\therefore the total area of shaded sails is 41 cm^2 .

10. What's Missing?

Consider the diagram below.

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

Angle measure	Justification
$x = 60^\circ$	<ul style="list-style-type: none"> • 85° can be transferred into the triangle because opposite angles are equal • last angle in triangle is 30° because sum of interior angles in triangle = 180° • x is a complementary angle to 30° (sum to 90°) $\therefore x = 90 - 30$ which is 60°
$y = 133^\circ$	<ul style="list-style-type: none"> • Using supplementary angles, able to find 72° and 95° • y is determined by subtracting all 3 known angles in the quadrilateral from 360° because interior angles in quadrilateral add to 360°



Sec 2-4

EQAO Sample Questions:

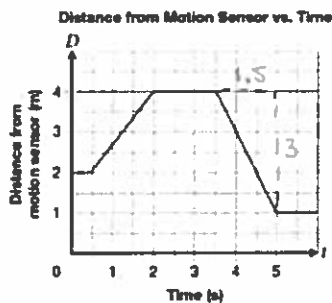
1. What are the slope, m , and y -intercept, b , of the line represented by: $3x - 2y + 16 = 0$?

- a $m = \frac{3}{2}, b = 8$
$$\begin{aligned} -2y &= -3x - 16 \\ \frac{-2y}{-2} &= \frac{-3x - 16}{-2} \\ y &= \frac{3}{2}x + 8 \end{aligned}$$
- b $m = \frac{2}{3}, b = -16$
- c $m = -\frac{2}{3}, b = -8$
- d $m = -\frac{3}{2}, b = 16$

See 3-2

2. Tyler walks along a line leading from a motion sensor. The graph below shows information about Tyler's walk. Which of the following is closest to Tyler's speed in metres per second as he walks toward the motion sensor?

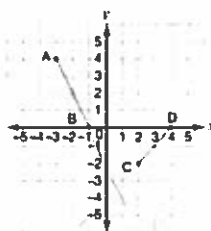
- a 2.0
 b 1.3
 c 0.8
 d 0.5



See 3-2

3. Consider the following graph. Which statement is false?

- a The slope of AB is -2.
 b The slope of CD is 1.
 c The y -intercept of the line through CD is -4.
 d The y -intercept of the line through AB is -1.



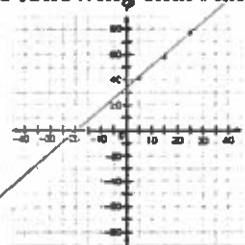
See 3-2

4. A bus is rented for a class field trip. The transportation cost for the trip is made up of \$225 to rent the bus, \$50 for gas and \$2 for each bus seat. Which relation below describes the total transportation cost for the trip if C is the total cost in dollars and n is the number of seats?

- a $C = -2n + 225$
 b $C = -2n + 275$
 c $C = 2n + 225$
 d $C = 2n + 275$

See 3-4

5. Consider the following chart and graph.



What temperature in degrees Celsius is equivalent to -20°F ?

- a -4°C
 b -18°C
 c -29°C
 d -40°C

Temperature in degrees Celsius, $^\circ\text{C}$	Temperature in degrees Fahrenheit, $^\circ\text{F}$
5°	41°
15°	59°
25°	77°

See 3-2

6. A sports company uses the equation

$C = 8t + 5$ to represent the relationship between the total amount charged to rent a canoe, C , in dollars and the rental time, t , in hours. What is the initial charge to rent a canoe?

- a \$0
 b \$5
 c \$8
 d \$13

See 3-2

7. The total cost of hiring Beth's Plumbing Services is represented by the equation $C = 50t + 70$, where C is the total cost in dollars and t is the time in hours. Next month, the rate will change to \$60 per hour, but the initial charge will stay the same. Which of the following describes how the graph of the relation will change?

- a) The steepness of the line will increase
- b) The steepness of the line will decrease
- c) The vertical intercept will increase by 10 units
- d) The vertical intercept will decrease by 10 units

See 3-1

8. Janelle draws a line that passes through the points $(-1,6)$ and $(0,3)$. If Janelle writes the equation of the line in

$y = mx + b$ form, what are the values of m and b ?

a $m = -9, b = 3$

b $m = -3, b = 6$

c $m = -9, b = 6$

d $m = -3, b = 3$

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{3 - 6}{0 - (-1)} = \frac{-3}{1} = -3$
 $y = mx + b$
 $3 = -3(0) + b$
 $3 = b$
 OR
 just look at the point $(0,3)$ See 3-2 as it is a y-intercept (on y-axis)

9. What's the Charge?

The table below represents the linear relationship between cost and repair time at an appliance store.

Repair time, t (h)	Cost, C (\$)
3	205
6	385
8	505

$m = \frac{\$180}{3 \text{ hr}} = \$60/\text{hr}$ or $\frac{\$120}{2 \text{ hr}} = \$60/\text{hr}$

→ finish pattern in table to determine the cost of 0 hr of repair time

Determine initial value of this relationship. Show your work

Initial value: 25

Is this relationship a direct or partial variation? Justify your answer.

the initial fee is \$25 meaning the line goes through $(0,25)$ and not $(0,0)$. See 3-2

10. The New Line

A line has

- The same slope as the line represented by $4x - 3y + 15 = 0$
- The same y-intercept as the line represented by $2x + y + 6 = 0$

Determine an equation of this line. Show your work.

Find slope of line:
 $4x - 3y + 15 = 0$
 $-\frac{3}{3}y = \frac{-4x - 15}{-3}$
 $y = \frac{4}{3}x + 5$
 ∴ slope of new line is also $m = \frac{4}{3}$

Find y-intercept of $2x + y + 6 = 0$

See 3-4

Method 1:
 (Sub $x=0$)
 $2(0) + y + 6 = 0$ or
 $y + 6 = 0$
 $y = -6$

Method 2: (rearrange into $y = mx + b$ form)
 $2x + y + 6 = 0$
 $y = -2x - 6$
 ↑
 y-intercept

∴ equation of the new line is $y = \frac{4}{3}x - 6$