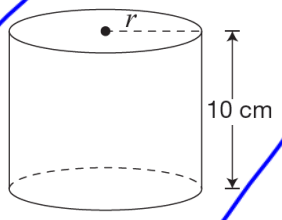
Review and EQAO Practice for Chapter 4 – Equations

2017

2 The cylinder pictured below has a volume of 500 cm^3 and a height of 10 cm.



Which of the following represents the radius of the cylinder, r, in centimetres?

Hint: $V = \pi r^2 h$

a) $\sqrt{\frac{50}{\pi}}$

b) $\frac{\sqrt{50}}{\pi}$

c) $\frac{50}{\pi}$

d) $\frac{50}{2\pi}$

$500 = \pi r^2 (10)$

$\frac{500}{10} = \pi r^2$

$50 = \pi r^2$

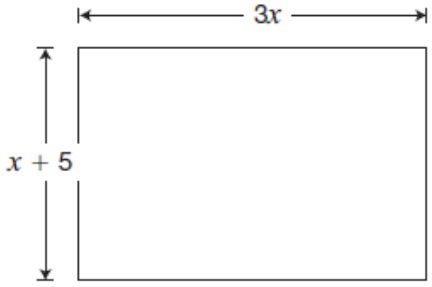
$\frac{50}{\pi} = r^2$

Square root both sides

$\sqrt{\frac{50}{\pi}} = r$

2015

3 A rectangle is shown below with algebraic expressions for its length and width in centimetres.



Which expression represents the area of the rectangle in cm^2?

a) $4x + 5$

b) $8x + 10$

c) $3x^2 + 5$

d) $3x^2 + 15x$

$A = l \cdot w$

$= (3x)(x+5)$

$= 3x^2 + 15x$

4 The equation below can be used to convert between temperatures in degrees Celsius, C, and temperatures in degrees Fahrenheit, F.

$$\frac{C}{5} = \frac{F - 32}{9}$$

Which correctly completes the statement?

If the temperature in degrees Celsius is 15 the temperature in degrees Fahrenheit is

a) less than 0.

b) greater than 60.

c) between 20 and 40.

d) between 40 and 60.

$\frac{15}{5} = \frac{F-32}{9}$

$\times 9 \quad 3 = \frac{F-32}{9} \quad \times 9$

$9 \times 3 = F - 32$

$27 = F - 32$

$27 + 32 = F$

$59 = F$

4 What is the solution to the equation below?

$$\frac{2}{3}x - 4 = 20$$

a) $x = 12$

b) $x = 16$

c) $x = 24$

d) $x = 36$

$\frac{2}{3}x = 20 + 4$

$\frac{2}{3}x = 24$

$x = \frac{24}{(2/3)}$ $\quad x = 36$

Strategy: do not solve using guess and check, solve by rearranging the equation

2014

5 What is the value of x in the equation $-4(2x - 1) = 36$?

a -4

b $-\frac{35}{8}$

c $-\frac{37}{8}$

d -5

$-8x + 4 = 36$

$-8x = 36 - 4$

$-8x = 32$

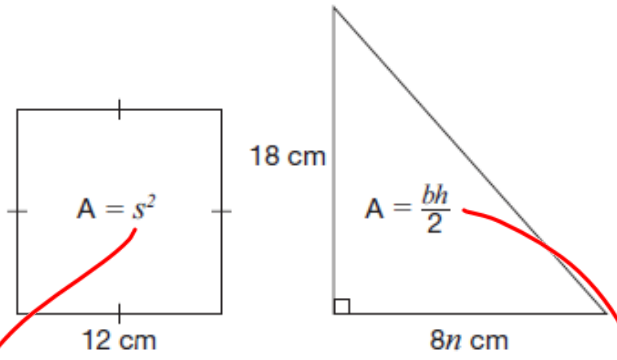
$x = \frac{32}{-8}$

$x = -4$

Strategy: do not solve using guess and check, solve by rearranging the equation

2013

5 The square and the triangle below have the same area.



What is the value of n?

a 1

b 2

c 8

d 16

$A_{square} = A_{triangle}$

$s^2 = \frac{b \times h}{2}$

$(12)^2 = \frac{8n \cdot 18}{2}$

$144 = \frac{8n \cdot 18}{2}$

$2 \times 144 = 144n$

$288 = 144n$

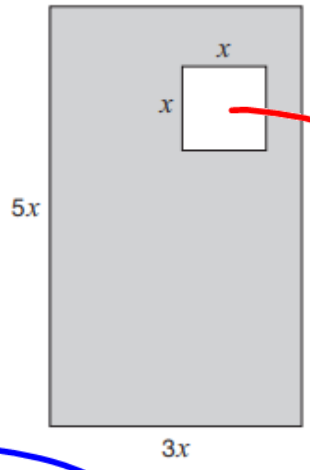
$\frac{288}{144} = n$

$n = 2$

2018

8 Square Removed

This rectangle has a square removed. There are algebraic expressions for the sides, in centimetres.



The area of the rectangle without the square is 126 cm^2.

Determine the side length of the square, x, in centimetres.

Show your work.

$A = (5x)(3x) - (x)(x)$

$126 = 15x^2 - x^2$

$126 = 14x^2$

$\frac{126}{14} = x^2$

$9 = x^2$

$\sqrt{9} = x$

$x = 3$

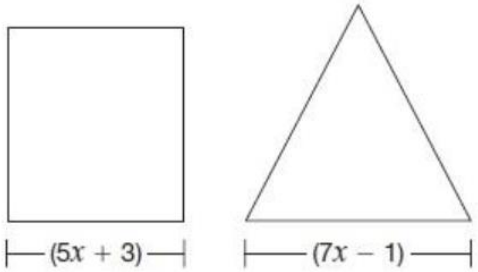
$\therefore$ the side length x is 3cm

Review and EQAO Practice for Chapter 4 – Equations PART 2

Questions from EQAO 2012 and older

* means all sides are equal or the same

27 A square and an equilateral triangle are pictured below.



If the square and the triangle have the same perimeter, what is the value of x?

a 2

b 4

c 9

d 15

perimeter square = perimeter triangle

$P = 2l + 2w$

$P = 2(5x+3) + 2(5x+3)$

$P = 10x + 6 + 10x + 6$

$P_{square} = 20x + 12$

$P = S_1 + S_2 + S_3$

$P = (7x-1) + (7x-1) + (7x-1)$

$P = 7x + 7x + 7x - 1 - 1 - 1$

$P_{triangle} = 21x - 3$

$P_{square} = P_{triangle}$

$20x + 12 = 21x - 3$

$12 + 3 = 21x - 20x$

$15 = x$

33 Bob is thinking of a number. He adds 15 to his number and finds that the result is four times his number.

Suppose x is Bob's number. Which equation is always true?

a $15 - x = \frac{x}{2}$

b $15 - x = 4x$

c $x + 15 = \frac{x}{4}$

d $x + 15 = 4x$

7 The equation $d = 3.6 \times \sqrt{h}$ represents the relationship between the distance, d, that a person can see in an open field, in kilometres, and the person's height, h, in metres.

One afternoon, Amy can see a distance of 4.5 km.

Which of the following is closest to Amy's height?

a 1.1 m

b 1.6 m

c 2.1 m

d 2.5 m

$d = 3.6 \times \sqrt{h}$

$4.5 = 3.6 \times \sqrt{h}$

* divide both sides by 3.6

$\frac{4.5}{3.6} = \frac{3.6 \times \sqrt{h}}{3.6}$

$1.25 = \sqrt{h}$

* square both sides

$(1.25)^2 = (\sqrt{h})^2$

$1.5625 = h$

$h = 1.6$ (after rounding)

Practice rearranging the equation: do not solve using guess and check

46 Disc-ussion

Tyler, Raven and Deb are discussing the number of CDs they each own. They find that the following statements are true:

- Tyler owns five more than twice the number of CDs Raven owns.
- Deb owns three times as many CDs as Tyler.

Using x to represent the number of CDs Raven owns, write an expression for the total number of CDs the three friends own. Show your work and simplify your answer.

let x represent the number of CDs Raven owns

Raven → x

Tyler → 2x + 5

Deb → 3(2x+5)

= 6x + 15

Total = Raven + Tyler + Deb

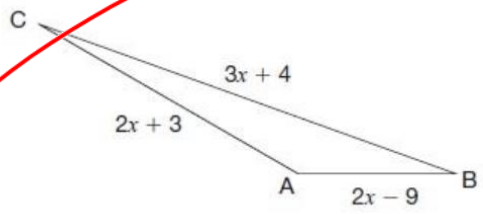
= x + 2x+5 + 6x+15

= x + 2x + 6x + 5 + 15

Total = 9x + 20

47 What Side?

The perimeter of the triangle below is 75 m.



Determine the measure of each side of the triangle.

Show your work.

P = side 1 + side 2 + side 3

75 = (3x+4) + (2x-9) + (2x+3)

75 = 3x + 2x + 2x + 4 - 9 + 3

75 = 7x - 2

75 + 2 = 7x

77 = 7x

$\frac{77}{7} = \frac{7x}{7}$

11 = x

Kyle isolates the variable w by performing the following steps on a test. On which step did he make an error?

GIVEN: $P = 2(l + w)$

STEP 1: $P = 2l + 2w$

STEP 2: $P + 2l = 2w$

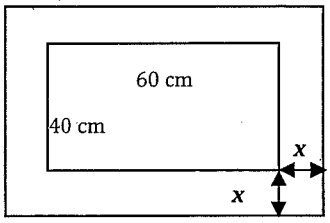
STEP 3: $\frac{P + 2l}{2} = \frac{2w}{2}$

STEP 4: $\frac{P}{2} + l = w$

$P - 2l = 2w$ ← Sign changes when you move across the equal sign

a) Step 1 b) Step 2 c) Step 3 d) Step 4

A rectangular portrait measures 40 cm wide by 60 cm in height. A frame that surrounds the portrait is x cm in thickness. If the perimeter of the outside of the frame is 256 cm. What is the thickness of the frame?



$P = 2l + 2w$

$P = 2(60 + 2x) + 2(40 + 2x)$

* distribute

$256 = 120 + 4x + 80 + 4x$

* collect like terms

$256 = 200 + 8x$

$256 - 200 = 8x$

$56 = 8x$

$\frac{56}{8} = \frac{8x}{8}$

$x = 7$

a) 56 cm b) 7 cm c) 14 cm d) 28 cm