

Math 10 C - Review from Grade 9

Name: Key

Definitions

1. An fraction is ... written in the form $\frac{a}{b}$, $b \neq 0$

2. The volume of a cylinder (like a pop can) is found using the formula ...

$$V = (\text{area of base})(\text{height})$$
$$= (\pi r^2)(h)$$

3. Describe where the following formulas are used.

a. $C = 2\pi r$

Rearrange the formula for r

- circumference for a circle

$$r = \frac{C}{2\pi}$$

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

Rearrange the formula for b

- Pythagorean theorem for right triangles

$$b = \sqrt{c^2 - a^2}$$

Solve the following without using a calculator. Show your work.

1. $\frac{2^2 + 3^2}{6}$

$$= \frac{4 + 9}{6}$$

$$= 6$$

2. $x - 15 = 27$

$$x = 27 + 15$$

$$= 42$$

3. $3x - 4 = -2x + 16$

$$5x = 20$$

$$x = 4$$

4. $\frac{3}{x} - \frac{5}{6} = \frac{1}{3}$ LCD = $6x$

$$\frac{3(6)}{x(6)} - \frac{5x}{6x} = \frac{1(2x)}{3(2x)}$$

$$\frac{18}{6x} - \frac{5x}{6x} = \frac{2x}{6x}$$

$$18 - 5x = 2x$$

$$-7x = -18$$

$$x = \frac{18}{7}$$

4. What two values satisfy $x^2 = 25$?

$$\pm 5$$

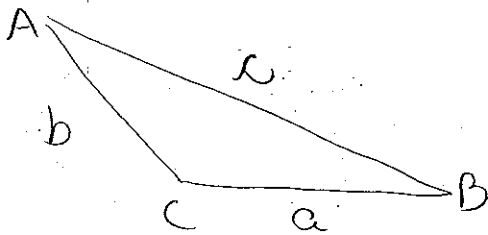
5. Simplify the following polynomials?

a. $2x(3x-5)$
 $= 6x^2 - 10x$

b. $\frac{3x^2+9x}{3x}$
 $= \frac{3x(x+3)}{3x}$
 $= x+3$

c. $3(x-4) - (2x+5) + \frac{6x^2+12x}{2x}$
 $3x-12-2x-5 + \frac{6x^2+12x}{2x}$
 $= 3x-12-2x-5 + 3x+6$
 $= 4x-11$

6. Label the sides and angles of a triangle using A, B, C and a, b, c.



7. Explain the difference, if any, between -4^2 and $(-4)^2$.

$$-4^2 = -1(4 \times 4) = -16$$

$$(-4)^2 = -4 \times -4 = 16$$

8. Which is greater 2^{-4} or 4^{-2} ? Show your work.

$$\begin{aligned} 2^{-4} &= \frac{1}{2^4} = \frac{1}{16} \\ 4^{-2} &= \frac{1}{4^2} = \frac{1}{16} \end{aligned}$$

same!

Complete the following problems.

1. Which of the following expressions is equivalent to $\frac{x+3}{2}$?

- a) $x+3 \div 2$ b) $\frac{x}{2} + \frac{3}{2}$ c) $2(x+3)$
 $x + \frac{3}{2}$ $\frac{x+3}{2}$ $2x+6$

2. A string measuring 50 cm in length is cut into three pieces. One piece is twice as long as the shortest piece and the other piece is 14 cm longer than the shortest piece. Find the length of each piece of string.

let $x = \text{short piece}$ $x + 2x + x + 14 = 50$ $x \Rightarrow 9 \text{ cm}$
 another piece = $2x$ $4x + 14 = 50$ $2x \Rightarrow 18 \text{ cm}$
 " " = $x + 14$ $4x = 36$ $x + 14 \Rightarrow 23 \text{ cm}$
 $x = 9$

3. Lillian received 77%, 69%, 81% and 76% on her math tests. What mark does she need on her fifth test in order to achieve an average of at least 80%?

let $x = 5^{\text{th}}$ test mark

$$\frac{77 + 69 + 81 + 76 + x}{5} = 80$$

$$77 + 69 + 81 + 76 + x = 400$$

$$303 + x = 400$$

$$x = 400 - 303 = 97$$

77
269
81
76
303

4. Evaluate the following expressions for the numbers given.

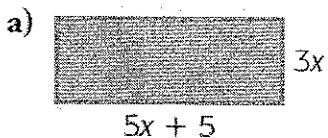
a. $x^3 + y^3$ when $x = 2$ and $y = -2$.

$$2^3 + (-2)^3 = \frac{1}{8} - \frac{64}{8}$$

$$= \frac{1}{2^3} + -8 = -\frac{63}{8}$$

$$= \frac{1}{8} + -8$$

5. Find the perimeter and area of the following figures.



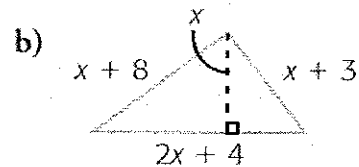
$$P = 2(3x) + 2(5x + 5)$$

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

$$= 16x + 10$$

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

$$= 15x^2 + 15x$$



$$P = x + 8 + x + 3 + 2x + 4$$

$$= 4x + 15$$

$$A = \frac{1}{2}(2x + 4)(x)$$

$$= (x + 2)(x)$$

$$= x^2 + 2x$$

