

Pre-Calculus: End of Semester 1 Math Skills Review

Name _____

Simplify the following. Express the answer in lowest terms.

$$1) \frac{8}{15} - \frac{1 \cdot 3}{5 \cdot 3}$$

$$\frac{8}{15} - \frac{3}{15}$$

$$= \frac{5}{15} = \boxed{\frac{1}{3}}$$

$$2) \frac{1}{8} + \frac{3 \cdot 2}{4 \cdot 2}$$

$$\frac{1}{8} + \frac{6}{8}$$

$$= \boxed{\frac{7}{8}}$$

$$3) \frac{5}{6} \times \frac{3}{7} =$$

$$\boxed{\frac{15}{42}}$$

$$4) \frac{2}{3} \div \frac{5}{7}$$

$$\frac{2}{3} \cdot \frac{7}{5} = \boxed{\frac{14}{15}}$$

5) If $y = x + (v-1)z + 8$, and $y = 5$, $x = 7$, and $v = 3$, then $z = ?$.

$$5 = 7 + (3-1)z + 8$$

$$5 = 7 + 2z + 8$$

$$5 = 2z + 15$$

-15

$$\frac{-10}{2} = \frac{2z}{2}$$

$$\boxed{z = -5}$$

$$6) (y^5 x^3)(x^8 y^7) =$$

$$\boxed{x^{11} y^{12}}$$

7) Factor the following:

$$a) (x^2 - 1x - 20)$$

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

$$b) (x^2 + 8x + 15)$$

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

$$c) (x^2 - 11x + 18)$$

$$(x-9)(x-2)$$

$$8) \text{ Solve for } b: (z) = \left(\frac{2a+5b}{2} \right) z$$

$$2z = 2a + 5b$$

$$-2a \quad -2a$$

$$\frac{2z - 2a}{2} = \frac{5b}{5}$$

$$\boxed{b = \frac{2z - 2a}{5}}$$

9) Write an expression to represent the following:

Two less than the product of a number and 5 is

half the sum of that same number and 8. Then solve for x.

$$5x - 2 = \frac{1}{2}(x + 8)$$

$$5x - 2 = \frac{1}{2}x + 4$$

$$-4 \quad -4$$

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

$$-5x \quad -5x$$

$$-6 = -4.5x$$

$$\boxed{x = 1.\bar{3} \text{ or } 1\frac{1}{3}}$$

10) If the price of an item is reduced by 12%, the sale price is \$114.39. What was the original price?

$$\frac{.88x}{.88} = \frac{114.39}{.88}$$

$$x = \boxed{\$129.99}$$

11) If $f(x) = x^2 - 2x + 4$, then $f(x+1) =$

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

$$x^2 + 2x + 1 - 2x - 2 + 4$$

$$\boxed{x^2 + 3}$$

12) If $f(x) = 8x - 3$, and $f(b) = 13$, then $b = ?$

$$13 = 8b - 3$$

$$+3 \quad +3$$

$$\frac{16}{8} = \frac{8b}{8}$$

$$\boxed{b = 2}$$

13) Solve $3x^2 - 5x - 7 = 0$. $a = 3$ $b = 5$ $c = -7$

$$x = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(3)(-7)}}{2(3)}$$

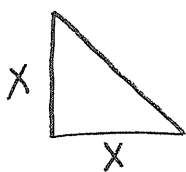
$$= \frac{5 \pm \sqrt{25 + 84}}{6}$$

$$\frac{5 + \sqrt{109}}{6} = \boxed{2.57 = x}$$

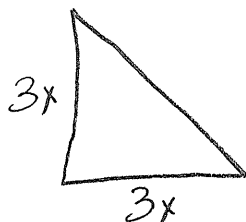
$$= \frac{5 \pm \sqrt{109}}{6}$$

$$\frac{5 - \sqrt{109}}{6} = \boxed{-0.91 = x}$$

14) The area of a triangle is A . A new triangle is formed by tripling the length of each of the sides. What is the area of the new triangle?



$$A = \frac{x^2}{2}$$



$$A = \frac{9x^2}{2}$$

$$\frac{\frac{9}{2} \cdot \frac{2}{1}}{\frac{1}{2}} = 9$$

$$\boxed{\text{Area of new } \Delta = 9A}$$