

These review lessons should not be considered a comprehensive review of all topics. You should be reviewing ALL of your notes, quizzes, tests, and textbook to prepare for the exam/summative.

Unit II Review - Equivalent Algebraic Expressions June. 12/14

1. Factor. a) $6x(2x-9) - 5(2x-9)$

$$= (2x-9)(6x-5)$$

b) $3mn+9m+2n+6$

$$= 3m(n+3) + 2(n+3)$$

$$= (3m+2)(n+3)$$

c) $35y^2+11y-6$

$$= (5y+3)(7y-2)$$

d) $48t^2+22t-15$

$$= 48t^2 + 40t - 18t - 15$$

$$= 8t(6t+5) - 3(6t+5)$$

$$= (6t+5)(8t-3)$$

$P = 48 \times 15 = -720$
 $S = 22$

2. Simplify and state the restriction(s) on the variable. 3. Use factoring to determine the x-intercepts of $y=6x^3-3x^2-8x+4$.

a) $\frac{m(m-1)^2}{7m+49} + \frac{m(m-1)}{m+7}$

$$= \frac{\cancel{m(m-1)} \cdot \cancel{m(m-1)}}{7(m+7)} \times \frac{\cancel{m+7}}{\cancel{m(m-1)}}$$

$$= \frac{m-1}{7} \quad m \neq 0, 1, -7$$

$$0 = 6x^3 - 3x^2 - 8x + 4$$

$$0 = 3x^2(2x-1) - 4(2x-1)$$

$$0 = (2x-1)(3x^2-4)$$

$$2x-1=0 \text{ or } 3x^2-4=0$$

$$x = \frac{1}{2}$$

$$x^2 = \frac{4}{3}$$

$$x = \pm \frac{2}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}}$$

$$= \pm \frac{2\sqrt{3}}{3}$$

4. Simplify and state the restriction(s) on the variable(s).

a) $\frac{14mn^3}{21m^4n^2}, m \neq 0, n \neq 0$

$$\frac{14 \cancel{m} \cdot n \cdot \cancel{n} \cdot \cancel{n}}{21 \cdot \cancel{m} \cdot \cancel{m} \cdot \cancel{m} \cdot \cancel{m} \cdot \cancel{n} \cdot \cancel{n}}$$

$$= \frac{2n}{3m^3}$$

b) $\frac{6x+24}{x^2+8x+16}$

$$= \frac{6(x+4)}{(x+4)^2}, x \neq -4$$

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

5. Simplify and state the restriction(s) on the variables.

$$\begin{aligned} & \frac{6}{3x-2} - \frac{1}{8y+1} \\ &= \frac{6(8y+1) - 1(3x-2)}{(3x-2)(8y+1)}, x \neq \frac{2}{3}, y \neq -\frac{1}{8} \\ &= \frac{48y+6-3x+2}{(3x-2)(8y+1)} \\ &= \frac{48y-3x+8}{(3x-2)(8y+1)} \end{aligned}$$

Unit III Review - Quadratic Functions

1. Simplify each of the following.

a) $3\sqrt{2} \times 2\sqrt{32}$

$$\begin{aligned} &= 6\sqrt{2 \times 32} \\ &= 6\sqrt{64} \\ &= 48 \end{aligned}$$

b) $4\sqrt{8}(3\sqrt{5} + \sqrt{2})$

$$\begin{aligned} &= 12\sqrt{40} + 4\sqrt{16} \\ &= 12\sqrt{4 \times 10} + 4(4) \\ &= 24\sqrt{10} + 16 \end{aligned}$$

c) $\sqrt{10}(\sqrt{2} - \sqrt{5})$

$$\begin{aligned} &= \sqrt{20} - \sqrt{50} \\ &= \sqrt{4 \times 5} - \sqrt{25 \times 2} \\ &= 2\sqrt{5} - 5\sqrt{2} \end{aligned}$$

d) $(2\sqrt{6})^4$

$$\begin{aligned} &= [2(6)^{\frac{1}{2}}]^4 \\ &= 2^4 \cdot 6^2 = (2\sqrt{6})(2\sqrt{6})(2\sqrt{6})(2\sqrt{6}) \\ &= 16(36) = [4(6)][4(6)] \\ &= 576 = (24)(24) \\ &= 576 \end{aligned}$$

2. For what value(s) of k will the function $f(x) = 7x^2 + 3x + k$ have 2 real zeros.

$$\begin{aligned} D &> 0 \\ b^2 - 4ac &> 0 \\ (3)^2 - 4(7)(k) &> 0 \\ 9 - 28k &> 0 \\ -28k &> -9 \end{aligned}$$

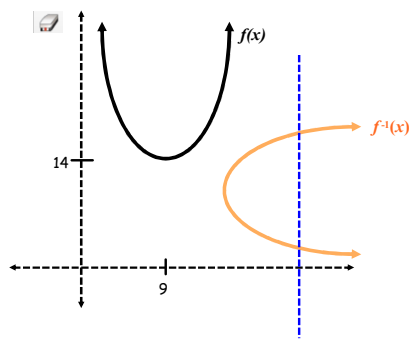
$$ax^2 + bx + c$$

$$\frac{-28k}{-28} < \frac{-9}{-28}$$

$$k < \frac{9}{28}$$

3. Determine whether or not the inverse of each of the following functions is also a function.

a) The function $f(x) = 16(x-9)^2 + 14$ with a domain of $x \in \mathbb{R}$.



No, $f^{-1}(x)$ is not a function b/c it fails the V.L.T.

4. Find the vertex by:

a) completing the square

$$\begin{aligned}
 y &= -2x^2 + 6x + 1 \\
 &= -2\left[x^2 - 3x + \frac{9}{4} - \frac{9}{4}\right] + 1 \\
 &= -2\left[\left(x - \frac{3}{2}\right)^2 - \frac{9}{4}\right] + 1 \\
 &= -2\left(x - \frac{3}{2}\right)^2 + \frac{9}{2} + \frac{2}{2} \\
 &= -2\left(x - \frac{3}{2}\right)^2 + \frac{11}{2} \\
 \text{Vertex} &= \left(\frac{3}{2}, \frac{11}{2}\right)
 \end{aligned}$$

b) partial factoring

$$\begin{aligned}
 y &= 3x^2 + 5x - 9 \\
 -9 &= 3x^2 + 5x - 9 \\
 0 &= x(3x + 5) \\
 x = 0 \text{ or } 3x + 5 = 0 \\
 (0, -9) \quad x = -\frac{5}{3} \\
 &\quad \quad \quad \left(-\frac{5}{3}, -9\right) \\
 x_v &= \frac{0 + \left(-\frac{5}{3}\right)}{2} \\
 &= -\frac{5}{6}
 \end{aligned}$$

$$\begin{aligned}
 y_v &= 3\left(-\frac{5}{6}\right)^2 + 5\left(-\frac{5}{6}\right) - 9 \\
 &= -\frac{133}{12} \\
 \therefore \text{Vertex is } &\left(-\frac{5}{6}, -\frac{133}{12}\right)
 \end{aligned}$$

Ch. 1 - 3

Pg. 206 # 1 - 3, 5 - 11, 13 - 20,

22 - 24, 26, 27, 30 - 32

ALSO: Word Problems/Max/Min problems etc

