

Algebra 2

Rational Functions Review

Name: _____

Date: _____ Period: _____

Simplify the following rational expressions.

$$1.) \frac{\frac{x^3 y^2 z}{a^2 b^2}}{\frac{a^3 x^2 y}{b^2}}$$

$$2.) \frac{\frac{b^2 - 100}{b^2}}{\frac{3b^2 - 31b + 10}{2b}}$$

$$3.) \frac{\frac{2c^2 + 9c + 9}{c + 1}}{\frac{10c^2 + 19c + 6}{5c^2 + 7c + 2}}$$

$$\frac{xyz}{A^5}$$

$$\frac{2(B + 10)}{B(3B - 1)}$$

$$C + 3$$

$$4.) \frac{3x^2 + 12x + 12}{2x^2 + x - 6} \cdot \frac{4x^2 - 9}{3x^3 + x^2 - 10x}$$

$$5.) \frac{g^2 + 5g + 4}{5g + 5} \div \frac{g^2 + 8g + 16}{g^2 + g - 12}$$

$$6.) \frac{3b^2 + 3b - 6}{b^2 - 6b + 5} \cdot \frac{b^2 - 25}{6b + 12}$$

$$\frac{3(2x + 3)}{x(3x - 5)}$$

$$\frac{(g - 3)}{5}$$

$$\frac{(B + 5)}{2}$$

$$7.) \frac{4a}{3bc} - \frac{15b}{5ac}$$

$$8.) \frac{3x + 3}{x^2 + 2x + 1} + \frac{x - 1}{x^2 - 1}$$

$$9.) \frac{3}{2n - 1} - \frac{2}{1 - 2n}$$

$$\frac{20A^2 - 45B^2}{15ABC}$$

$$\frac{4}{(x + 1)}$$

$$\frac{5}{(2n - 1)}$$

$$10.) \frac{4}{4x^2 - 4x + 1} - \frac{5x}{20x^2 - 5}$$

$$11.) \frac{\frac{1}{x-5} + \frac{1}{x+1}}{\frac{1}{x-5} - \frac{1}{x+1}}$$

$$12.) \frac{1 - \frac{2}{x}}{1 - \frac{1}{x} - \frac{2}{x^2}}$$

$$\frac{(20 - 5x)}{5(2x - 1)(2x + 1)}$$

$$\frac{(x - 2)}{3}$$

$$\frac{x}{(x + 1)}$$

Solve the following rational equations. (Don't forget to check for extraneous answers)

13.) $\frac{3}{k-3} + \frac{4}{k-4} = \frac{25}{k^2-7k+12}$

▣ $x = 7$

14.) $\frac{c+1}{c-3} = 4 - \frac{12}{c^2-2c-3}$

▣ $c = 5$ $c = \frac{1}{3}$

15.) $\frac{1}{2h} + \frac{5}{h} = \frac{3}{h-1}$

▣ $h = \frac{11}{5}$

16.) $\frac{4}{w-2} = \frac{-1}{w+3}$

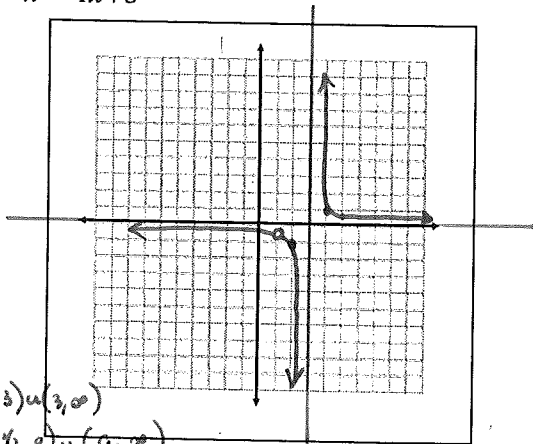
▣ $w = -2$

17.) $\frac{6}{x-1} = \frac{4}{x-2} + \frac{2}{x+1}$

▣ NO SOLUTION

Graph each of the following and find the information listed below.

18.) $f(x) = \frac{x-1}{x^2-4x+3}$



V.A.: $x = 3$

H.A.: $y = 0$

Hole: $x = 1$

Domain: $(-\infty, 1) \cup (1, 3) \cup (3, \infty)$

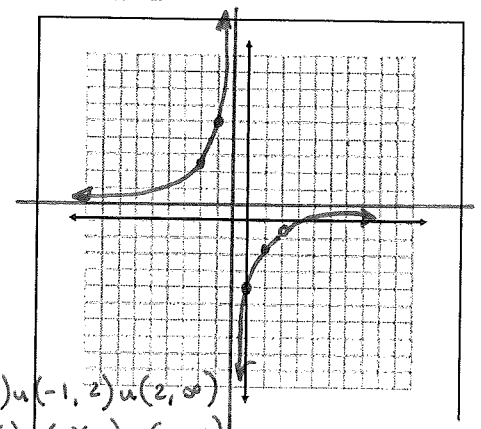
Range: $(-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, 0) \cup (0, \infty)$

Solutions:

End behavior: AS $x \rightarrow \infty$, $f(x) \rightarrow 0$

AS $x \rightarrow -\infty$, $f(x) \rightarrow 0$

19.) $h(x) = \frac{x^2-6x+8}{x^2-x-2}$



V.A.: $x = -1$

H.A.: $y = 1$

Hole: $x = 2$

Domain: $(-\infty, -1) \cup (-1, 2) \cup (2, \infty)$

Range: $(-\infty, -\frac{2}{3}) \cup (-\frac{2}{3}, 1) \cup (1, \infty)$

Solutions: $x = 4$ (4, 0)

End behavior:

AS $x \rightarrow \infty$, $f(x)$