# Standard 4 Review: Name: _____

**1.** Find the Domain of the following functions.

**a.** $f(x) = 3x^2 + 7x - 11$

Any real number

**b.** $g(x) = \dfrac{2x}{x^2 - 4}$

$x \neq 2, -2$

**c.** $h(x) = \sqrt{x - 7}$

$x \geq 7$

**d.** $j(x) = \dfrac{\sqrt{x+3}}{x^2 - 11x + 28}$ oops

$x \geq -3$ and $x \neq 4, 7$

**2.** Simplify.

**a.** $\dfrac{x-5}{x^2-25} = \dfrac{1}{x+5}$

**b.** $\dfrac{x^2 - 5x - 14}{x - 2} = \dfrac{(x-7)(x+2)}{(x-2)}$ simplified

**c.** $\dfrac{x^2 + 6x - 27}{x^2 - 1x + 30} = \dfrac{x+9}{x-10}$

**d.** $\dfrac{x^2}{x^2 + x} = \dfrac{x}{x+1}$

**3.** Multiply or Divide and Simplify.

**a.** $\dfrac{x^2 + 4x}{x^2 - 16} \bullet \dfrac{x-4}{x} = 1$

**b.** $\dfrac{x^2 + 6x + 8}{x^2 + x - 12} \bullet \dfrac{x^2 - 9}{x + 2} = x + 3$

**c.** $\dfrac{x^2 + 5x + 6}{x^2 - 8x - 33} \div \dfrac{x^2 + 8x + 12}{x + 6}$

$= \dfrac{1}{x-11}$

**d.** $\dfrac{x^2 - 5x - 14}{x^2 - 36} \div \dfrac{x^2 - 7x - 18}{x^2 - 15x + 54}$

$= \dfrac{x-7}{x+6}$

**4.** Add or Subtract and Simplify.

**a.** $\dfrac{8}{x+2} + \dfrac{x}{x-3} = \dfrac{(x+12)(x-2)}{(x+2)(x-3)}$

**b.** $\dfrac{x-4}{x-8} - \dfrac{40}{x^2 - 6x - 16} = \dfrac{x+6}{x+2}$

**c.** $\dfrac{6}{x^2 + 2x - 8} + \dfrac{1}{x^2 - 5x + 6}$

$= \dfrac{7}{(x+4)(x-3)}$

**d.** $\dfrac{x+1}{x^2 + 4x - 5} - \dfrac{2}{x^2 + 8x + 15}$

$= \dfrac{x^2 + 2x + 5}{(x+5)(x-1)(x+3)}$

**5.** Simplify.

**a.** $\dfrac{3+\dfrac{9}{x-3}}{4+\dfrac{12}{x-3}}$ $= \dfrac{3}{4}$

**b.** $\dfrac{\dfrac{1}{x+2}+\dfrac{2}{x}}{\dfrac{4}{x}+\dfrac{2}{x(x+2)}}$ $= \dfrac{3x+4}{2(x+5)}$

**6. Solve.**

**a.** $\dfrac{3x+2}{2}=\dfrac{1}{4}$

$x = -\dfrac{1}{2}$

**b.** $x+\dfrac{x}{6}+\dfrac{x}{3}=3$

$x = 2$

**c.** $3x-\dfrac{x-2}{4}+6=\dfrac{x+7}{5}$

$x = -2$

**d.** $\dfrac{10}{x-2}=5$

$x = 4$

**e.** $\dfrac{2x}{x-3}+\dfrac{x+3}{4}=0$

$x = -9, 1$

**f.** $1+\dfrac{2}{x+2}+\dfrac{4}{x-2}=0$

$x = 0, 6$

**g.** $\dfrac{5}{x+3}-\dfrac{3}{x}=\dfrac{1}{3x}$

$x = 6$

**h.** $\dfrac{x}{x+5}+\dfrac{1}{x-3}=\dfrac{13}{x^2+2x-15}$

$x = 4, -2$

**i.** $\dfrac{x+2}{x}=\dfrac{2}{x-1}$

$x = 2, -1$

**j.** $\dfrac{6}{x+4}=\dfrac{2}{3(x-2)}$

$x = 2.75$

**7. Solve.**

**a.** $\dfrac{x+1}{x-4} \geq 0$

$(-\infty, -1]$ and $(4, \infty)$

**b.** $\dfrac{x^2-4}{x} < 0$

$(-\infty, -2)$ and $(0, 2)$

**c.** $\dfrac{x^2+x-6}{x+1} > 0$

$(-3, -1)$ and $(2, \infty)$

**d.** $\dfrac{x-4}{x} \leq 2$

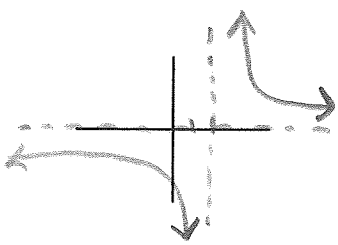
$(-\infty, -4]$ and $(0, \infty)$

**8. Find the equations for all the Vertical, Horizontal and Slant Asymptotes of the following Rational Functions. Use them to sketch a graph of the function.**

**a.** $f(x) = \dfrac{1}{x-2}$

V: $x=2$

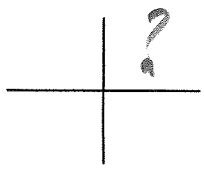
H/S: $y=0$



**b.** $g(x) = \dfrac{x^4}{x^2+4}$

V: none

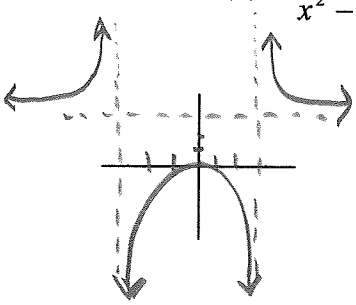
H/S: none




**c.** $h(x) = \dfrac{3x^2}{x^2-9}$

V: $x=3, x=-3$

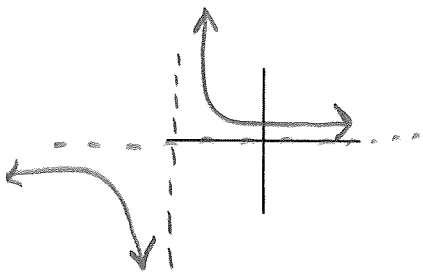
H/S: $y=3$



**d.** $j(x) = \dfrac{2x-4}{x^2+4x-12}$

V: $x=-6$

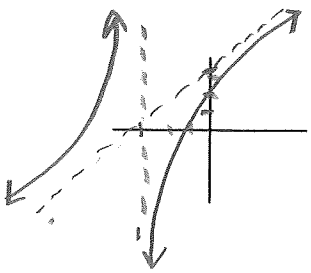
H/S: $y=0$



**e.** $f(x) = \dfrac{x^2+6x+8}{x+3}$

V: $x=-3$

H/S: $y=x+3$



**f.** $k(x) = \dfrac{2x+8}{4x-16}$

V: $x=4$

H/S: $y=\frac{1}{2}$