Name Key

Pre-Calculus Honors
Review Sheet

Ms. Hindal
Unit 2 Day 11

Objective 2.5: Graphing Rational Functions

Find the following for each function:

1. $f(x) = \dfrac{(\cancel{x-3})(\cancel{x+4})}{(x-5)(\cancel{x+4})(\cancel{x-3})} = \dfrac{1}{x-5}$, $x \neq -4$ or 3

2. $f(x) = \dfrac{4x^2 - 12x - 40}{x^2 - x - 20} = \dfrac{4(x-5)(x+2)}{(x-5)(x+4)}$

3. $f(x) = \dfrac{2x^2 - 7x + 3}{x - 1} = \dfrac{(2x-1)(x-3)}{(x-1)}$

1.

Domain: $x \neq 5, -4$ or 3

$(-\infty,-4)\cup(-4,3)\cup(3,5)\cup(5,\infty)$

Vertical asymptote(s): $x = 5$

graph or think about where f(x) undefined

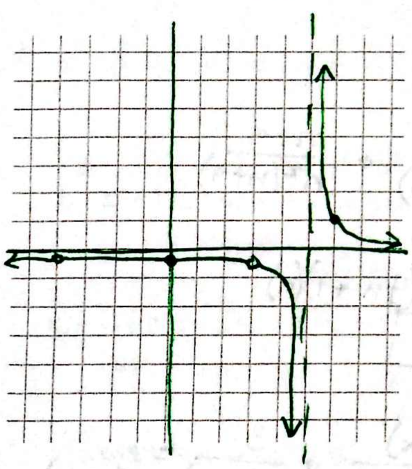
Hole(s): $(-4, -\frac{1}{9})$ and $(3, -\frac{1}{2})$

graph new function and trace or substitute in to simplified

End behavior asymptote: $y = 0$

x-intercept(s): none

y-intercept: $(0, -\frac{1}{5})$



2.

Domain: $x \neq 5$ or -4

$(-\infty,-4)\cup(-4,5)\cup(5,\infty)$

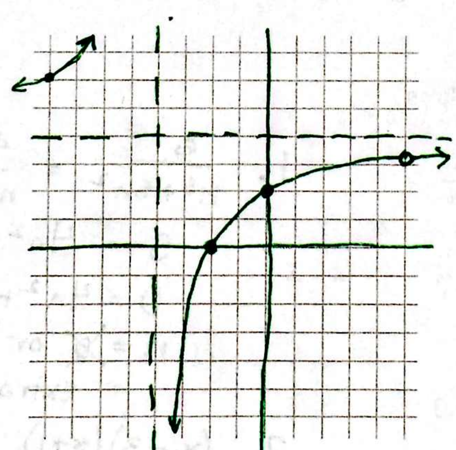
Vertical asymptote(s): $x = -4$

Hole(s): $(5, \frac{28}{9})$

End behavior asymptote: $y = 4$

x-intercept(s): $(-2, 0)$

y-intercept: $(0, 2)$



3.

Domain: $x \neq 1$

$(-\infty, 1)\cup(1,\infty)$

Vertical asymptote(s): $x = 1$

Hole(s): none

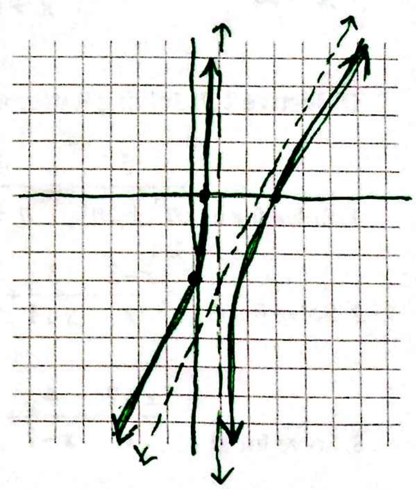
End behavior asymptote:

$$\begin{array}{r|l} & 2x - 5 \quad R -2 \\ x-1 & 2x^2 - 7x + 3 \\ & -(2x^2 - 2x) \\ & -5x + 3 \\ & -(-5x + 5) \\ & -2 \end{array}$$

$\boxed{y = 2x - 5}$

x-intercept(s): $(\frac{1}{2}, 0)$ & $(3, 0)$

y-intercept: $(0, -3)$



4. Create the equation for a rational function with a vertical asymptote at x = 2 and a hole when x = -1

$$f(x) = \frac{(\text{anything})(x+1)}{(x-2)(x+1)}$$

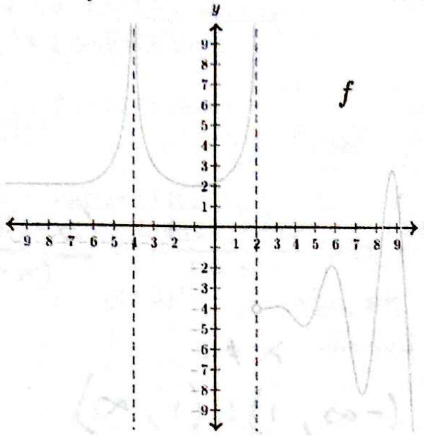
5. Create the equation for a rational function with an end behavior asymptote of y = 4

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

Name____________________

Objective 2.6: Introduction to Limits

1.



$\lim_{x\to -4} f(x) = \infty$

$\lim_{x\to 2} f(x) = \text{DNE}$

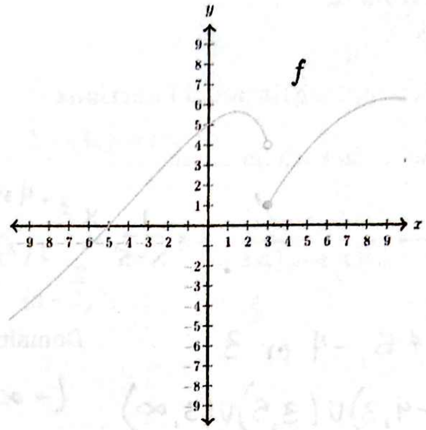
$\lim_{x\to 2^-} f(x) = \infty$

$\lim_{x\to 2^+} f(x) = -4$

$\lim_{x\to \infty} f(x) = -\infty$

What happens at $x = -4$?
a vertical asymptote

2.



$f(3) = 1$

$\lim_{x\to 3} f(x) = \text{DNE}$

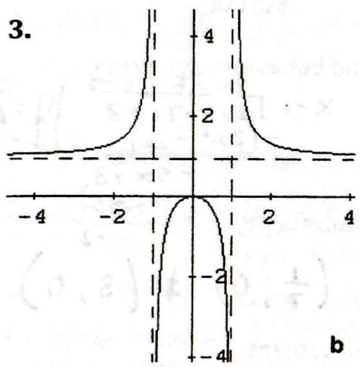
$\lim_{x\to 3^+} f(x) = 1$

$\lim_{x\to 3^-} f(x) = 4$

$\lim_{x\to -\infty} f(x) = -\infty$

$\lim_{x\to 0} f(x) = 5$

3.



$\lim_{x\to 1^-} f(x) = -\infty$

$\lim_{x\to 1^+} f(x) = \infty$

$\lim_{x\to \infty} f(x) = 1 \quad \lim_{x\to 1} f(x) = \text{DNE}$

4. $g(x) = \dfrac{x-4}{x^2+x-20} = \dfrac{x-4}{(x-4)(x+5)} = \dfrac{1}{x+5},\ x \neq 4$

$\lim_{x\to 4} g(x) = \frac{1}{9}$

$\lim_{x\to -5^+} g(x) = \infty$

$\lim_{x\to -\infty} g(x) = 0$

Objective 2.7: Solving Rational Equations

1. Solve for n: $\dfrac{5}{n^3+5n^2} = \dfrac{4}{n+5} + \dfrac{1}{n^2}$

2. Solve for x: $\dfrac{x-3}{x} - \dfrac{3}{x+1} + \dfrac{3}{x^2+x} = 0$

3. Solve for x: $\dfrac{x+2}{x} - \dfrac{4}{x-1} + \dfrac{2}{x^2-x} = 0$

1. $\dfrac{5}{n^3+5n^2} = \dfrac{4n^2}{n^2(n+5)} + \dfrac{n+5}{n^2(n+5)}$

$5 = 4n^2 + n + 5$

$0 = 4n^2 + n = (4n+1)(n)$

$n = \cancel{0}$ or $\boxed{-1/4}$
extraneous

2. $\dfrac{(x-3)(x+1)}{x(x+1)} - \dfrac{3(x)}{x(x+1)} + \dfrac{3}{x(x+1)} = \dfrac{0}{x(x+1)}$

$x^2 - 3x + x - 3 - 3x + 3 = 0$

$x^2 - 5x = 0 \Rightarrow x(x-5) = 0$

$x = \cancel{0}$ or $\boxed{5}$
extraneous

3. $\dfrac{(x+2)(x-1)}{x(x-1)} - \dfrac{4x}{x(x-1)} + \dfrac{2}{x(x-1)} = 0$

$x^2 + 2x - x - 2 - 4x + 2 = 0$

$x^2 - 3x = 0$

$x(x-3) = 0$

$x = \cancel{0}$ or $\boxed{3}$
extraneous