

Pre-Calculus: Graphing Rational Functions

Name Key

Date _____ Per _____

Identify all key features of the rational functions below, then graph those functions.

1) $f(x) = \frac{3}{x}$

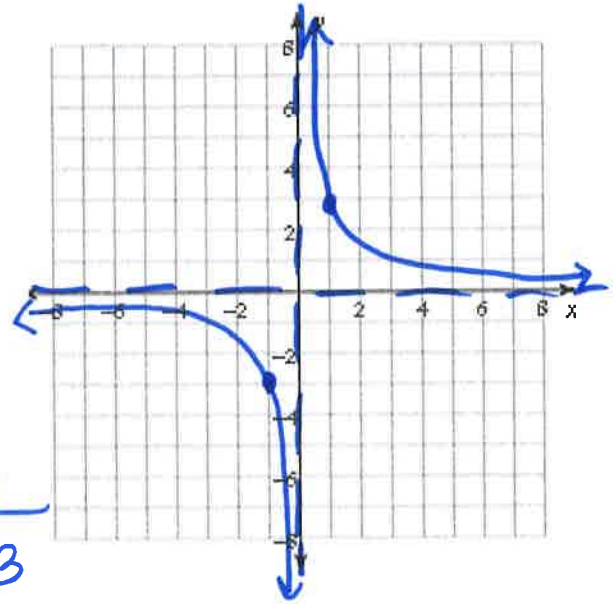
x-intercept(s) None y-intercept None

Vertical Asymptote(s) $x=0$

Holes None

End Behavior $y=0$

x	y
-1	-3
1	3



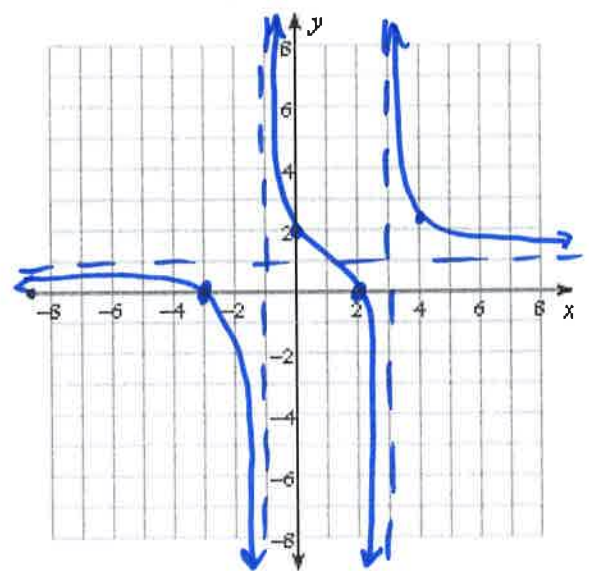
2) $f(x) = \frac{x^2+x-6}{x^2-2x-3} = \frac{(x+3)(x-2)}{(x+1)(x-3)}$

x-intercept(s) $(-3,0)$ y-intercept $(0,2)$
 $x+3=0$ $(-3,0)$ $f(0) = \frac{0+0-6}{0-0-3} = \frac{-6}{-3} = 2$
 $x-2=0$ $(2,0)$

Vertical Asymptote(s) $x=-1, x=3$
 $x+1=0$ $x-3=0$

Holes None

End Behavior $y=1$
 $n=2$ $m=2$



$f(4) = \frac{(4+3)(4-2)}{(4+1)(4-3)} = \frac{7(2)}{(5)(1)} = \frac{14}{5} = 2.8$

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

x-intercept(s) None y-intercept $(0, \frac{1}{3})$
 $f(0) = \frac{-1}{0+0-3} = \frac{-1}{-3} = \frac{1}{3}$

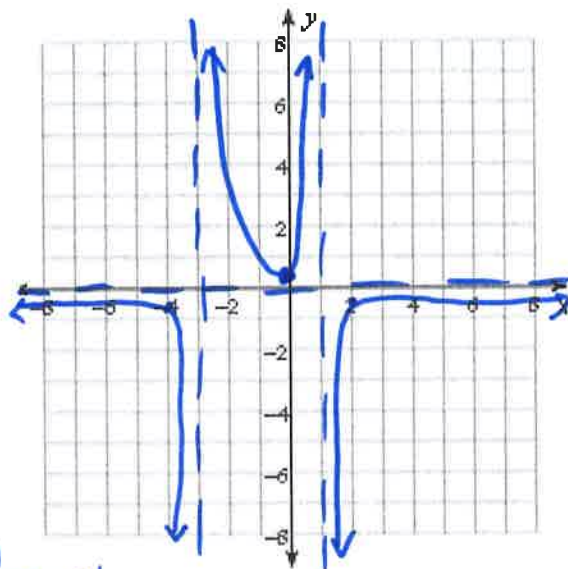
Vertical Asymptote(s) $x = -3, x = 1$
 $x+3=0 \quad x-1=0$

Holes None

End Behavior $y = 0$
 $n = 0$
 $m = 2$

$$f(-4) = \frac{-1}{(-4+3)(-4-1)} = \frac{-1}{-1(-5)} = \frac{-1}{5}$$

$$f(2) = \frac{-1}{(2+3)(2-1)} = \frac{-1}{(5)(1)} = \frac{-1}{5}$$



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

x-intercept(s) $(-1, 0)$ y-intercept $(0, -1)$
 $x+1=0$ $f(0) = \frac{0+1}{0-1} = \frac{1}{-1} = -1$

Vertical Asymptote(s) $x = 1$
 $x-1=0$

Holes None

End Behavior $y = 1$

$$n = 1 \quad m = 1$$

$$f(2) = \frac{2+1}{2-1} = \frac{3}{1} = 3$$

