Name: Key

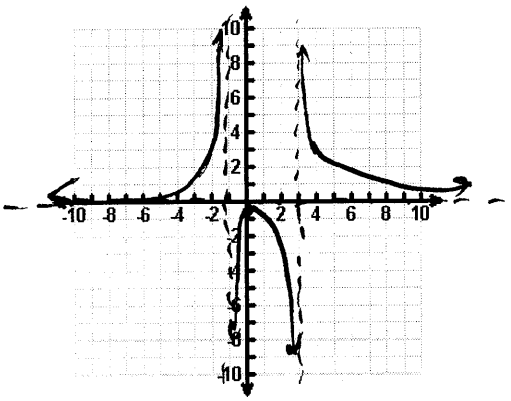
Alg2 Honors

9.1 - 9.3 Review

For #1-6, fill in the information and graph the functions. Then describe the end behavior using limits.

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

x-int	y-int	VA	EBA	Holes
none	$(0, -\frac{2}{3})$	$x=3$, $x=-1$	$y=0$	none

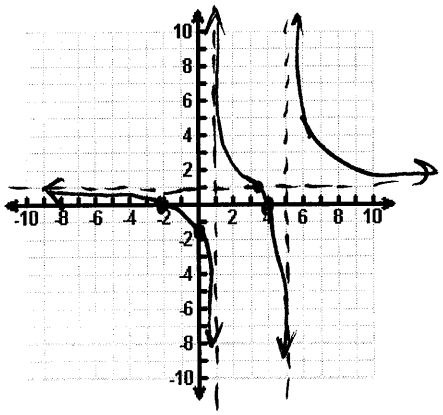


Domain: $(-\infty, -1) \cup (-1, 3) \cup (3, \infty)$

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

2) $f(x) = \dfrac{x^2 - 2x - 8}{x^2 - 6x + 5}$ $\quad \dfrac{(x-4)(x+2)}{(x-5)(x-1)}$

x-int	y-int	VA	EBA	Holes
$(4,0)$, $(-2,0)$	$(0, \frac{8}{5})$	$x=5$, $x=1$	$y=1$	none



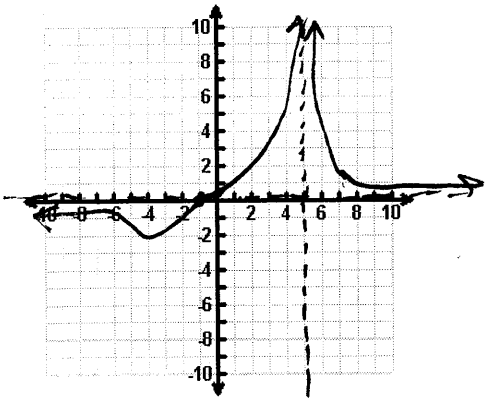
Domain: $(-\infty, 1) \cup (1, 5) \cup (5, \infty)$ $\quad \lim_{x \to \infty} f(x) = 1$ $\quad \lim_{x \to -\infty} f(x) = 1$

CROSS EBA!

$\dfrac{x^2 - 2x - 8}{x^2 - 6x + 5} = 1$ $\quad x^2 - 2x - 8 = x^2 - 6x + 5$ $\quad 4x = 13$ $\quad x = 3.25$

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

x-int	y-int	VA	EBA	Holes
$(-1, 0)$	$(0, \frac{1}{25})$	$x=5$	$y=0$	none



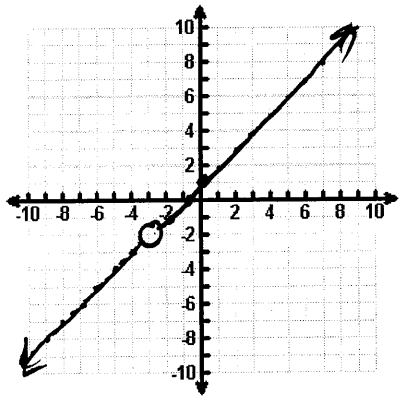
$\lim_{x \to \infty} f(x) = 0$ $\quad \lim_{x \to -\infty} f(x) = 0$

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

4) $f(x) = \dfrac{x^2+4x+3}{x+3}$

$\dfrac{(x+3)(x+1)}{(x+3)}$

$x+1$

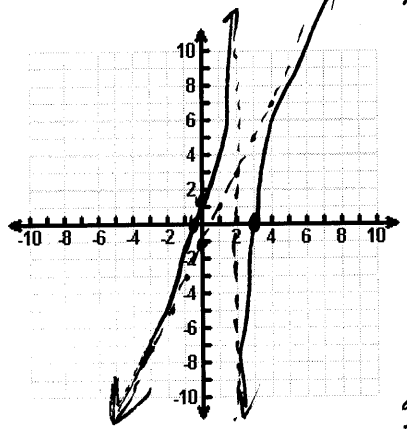


x-int	y-int	VA	EBA	Holes
$(-1,0)$	$(0,1)$	none	none	$(-3,-2)$

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

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

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



x-int	y-int	VA	EBA	Holes
$(-\frac{1}{2},0)$ $(3,0)$	$(0,\frac{3}{2})$	$x=2$	$y=2x-1$	none

2| 2 −5 −3

4 −2

2 −1 −5

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

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

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

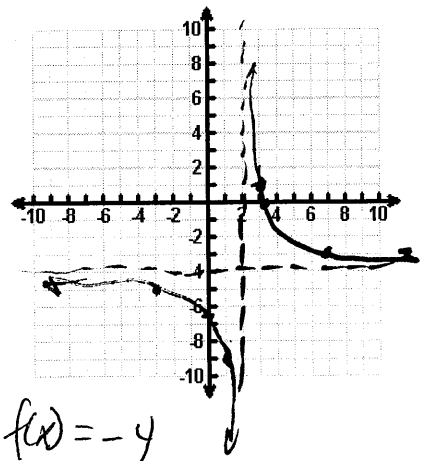
Cross EBA?

$\dfrac{2x^2-5x-3}{x-2} = 2x-1$ $2x^2-5x-3 = 2x^2-5x+2$ no.

6) $f(x) = \dfrac{5}{x-2} - 4$

$\dfrac{5}{x-2} = 4$

$5 = 4x-8$



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

Increasing: never

Zeros: $\left(\frac{13}{4},0\right)$

Range: $(-\infty,-4)\cup(-4,\infty)$

Decreasing: $(-\infty,2)\cup(2,\infty)$

Y-int: $(0,-6.5)$

Asymptotes: $x=2$ $y=-4$

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

7) z varies directly with x and inversely with the square of y. When x=4 and y=2, z=7. Find z if x=3 and y=4.

$z = \dfrac{kx}{y^2}$ $7 = \dfrac{k\cdot 4}{4}$ $k=7$ $z = \dfrac{7x}{y^2}$

$z = \dfrac{7\cdot 3}{16}$ $z = \dfrac{21}{16}$