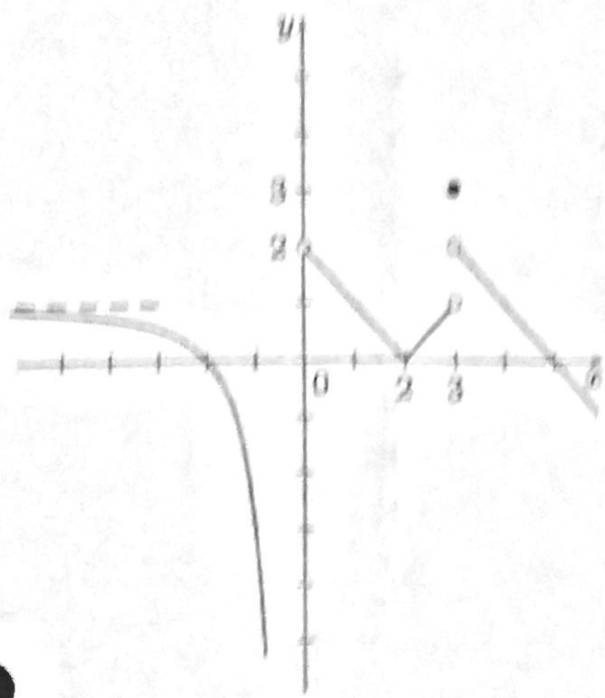


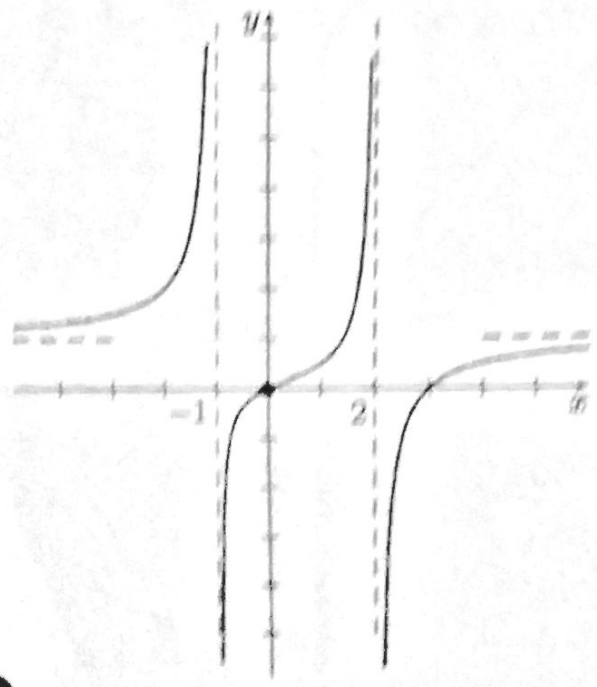
LIMITS FROM A GRAPH

Name Kerry
 Class _____ Date _____

Use the graphs of the functions below to answer each question. You may use ∞ or $-\infty$ along with DNE, to answer questions.



- (1) $\lim_{x \rightarrow 0^-} f(x) = \underline{-\infty}$
- (2) $\lim_{x \rightarrow 0^+} f(x) = \underline{DNE}$
- (3) $\lim_{x \rightarrow 3^-} f(x) = \underline{2}$
- (4) $\lim_{x \rightarrow 3} f(x) = \underline{DNE}$
- (5) $\lim_{x \rightarrow \infty} f(x) = \underline{1}$



- (6) $\lim_{x \rightarrow -1} f(x) = \underline{DNE}$
- (7) $\lim_{x \rightarrow 6} f(x) = \underline{0}$
- (8) $\lim_{x \rightarrow 2^+} f(x) = \underline{-\infty}$
- (9) $\lim_{x \rightarrow \infty} f(x) = \underline{1}$

Graphing, Continuity, and Limits for Rational Functions

EXPANS the function = $x^2 - x - 6$
CROSS the H.A. = $x^2 + x - 12$
 $x^2 + x - 12 = x^2 - x - 6$

Sketch the function $f(x) = \frac{x^2 - x - 6}{x^2 + x - 12}$ and complete the following: $2x = 6$
 $x = 3$ H.O.C.C.

$$f(x) = \frac{(x-3)(x+2)}{(x+4)(x-3)}$$

$f(x)$ has a 1) vertical asymptote at $x = -4$

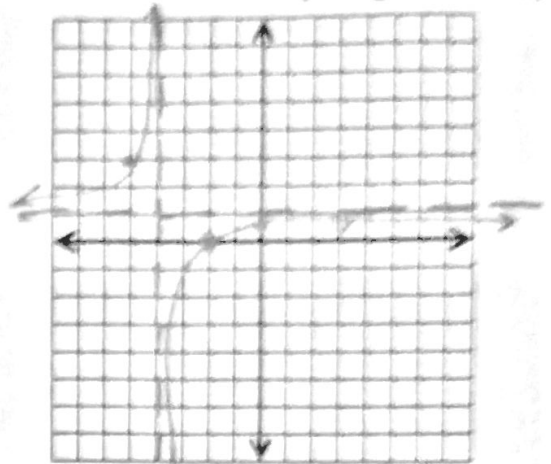
2) horizontal asymptote of $y = 1$

3) x - intercept of $(-2, 0)$

4) y - intercept of $(0, \frac{1}{2})$

5) removable discontinuity at $x = 3$ $\frac{3+2}{3+4} = \frac{5}{7}$ $(\frac{5}{7}, \frac{5}{7})$

and a 6) non-removable discontinuity at $x = -4$



Evaluate the following:

7) $f(-4) = \text{DNE}$ 8) $f(-2) = 0$ 9) $f(0) = \frac{1}{2}$ 10) $f(3) = \text{DNE}$

Evaluate the following limits or state "does not exist"

11) $\lim_{x \rightarrow -2} f(x) = 0$

16) $\lim_{x \rightarrow -4^-} f(x) = \infty$

12) $\lim_{x \rightarrow 0} f(x) = \frac{1}{2}$

17) $\lim_{x \rightarrow -4^+} f(x) = -\infty$

13) $\lim_{x \rightarrow 3^-} f(x) = \frac{5}{7}$

18) $\lim_{x \rightarrow -4} f(x) = \text{DNE}$

14) $\lim_{x \rightarrow 3^+} f(x) = \frac{5}{7}$

19) $\lim_{x \rightarrow +\infty} f(x) = 1$

15) $\lim_{x \rightarrow 3} f(x) = \frac{5}{7}$

20) $\lim_{x \rightarrow -\infty} f(x) = 1$

} proves
H.A. @
 $y = 1$

(Form A)