

# 4.4 day 2 notes

Monday, December 5, 2016 10:13 AM

A large area of horizontal blue lines for writing notes, with a vertical red margin line on the left side.

Algebra 2 Trig H

4.4 day 2 notes

Name:

Graph the following rational functions after finding characteristics of the function.

1.  $m(x) = \frac{5x-1}{x+2}$

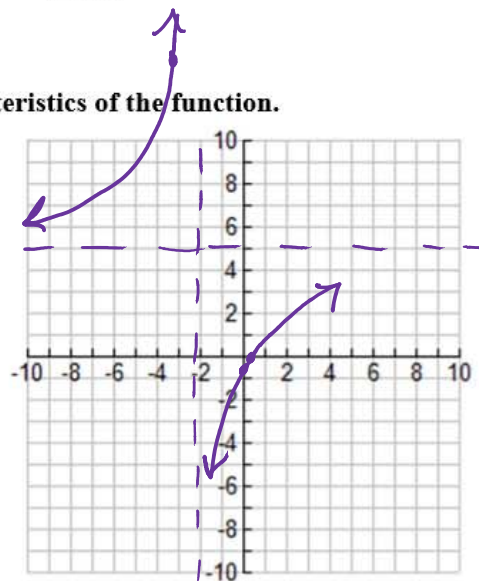
V.A.:  $x = -2$

H.A.:  $y = 5$

x-intercept:  $(1, 0)$

y-intercept:  $(0, -1/2)$

Extra point:  $(-3, 16)$



2.  $m(x) = \frac{5x-15}{x-3} = \frac{5(x-3)}{x-3} = 5$

V.A.: None

H.A.:  $y = 5$

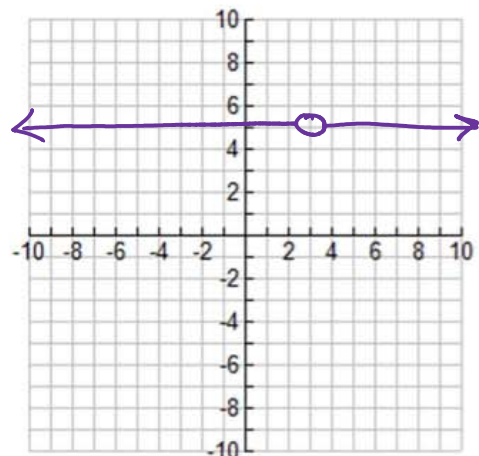
x-intercept: None

y-intercept:  $(0, 5)$

Hole:  $(3, 5)$

Extra point:

Domain:  $x \neq 3$



3.  $p(x) = \frac{4x-4}{x^2+2x-3} = \frac{4(x-1)}{(x-1)(x+3)} = \frac{4}{x+3}$

V.A.:  $x = -3$

H.A.:  $y = 0$

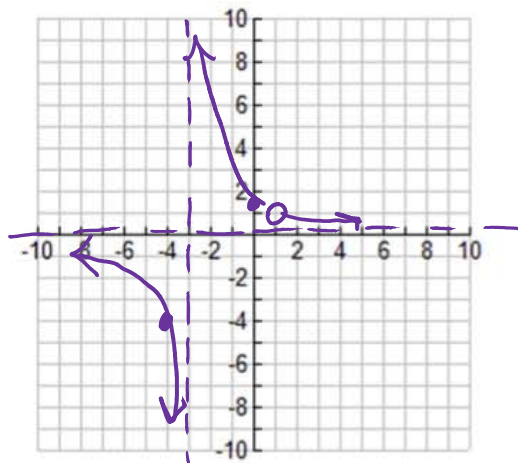
x-intercept: None

y-intercept:  $(0, 4/3)$

Hole:  $(1, 1)$

Extra point:  $(-4, -4)$

$\frac{4}{1+3} = \frac{4}{4}$



$$4. \quad a(x) = \frac{x^2 + 2x - 15}{x^2 + 3x - 10} = \frac{\cancel{(x+5)}(x-3)}{\cancel{(x+5)}(x-3)} = \underline{x-3}$$

V.A.:  $x = 2$

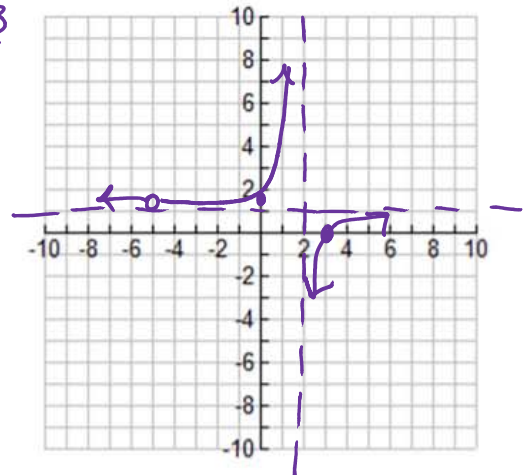
H.A.:  $y = 1$

x-intercept:  $(3, 0)$

y-intercept:  $(0, 3/2)$

Hole:  $(-5, 8/7)$

Extra point: unnecessary



$$5. \quad q(x) = \frac{x-4}{x^2-2x-8} = \frac{\cancel{x-4}}{\cancel{(x-4)}(x+2)} = \frac{1}{x+2}$$

V.A.:  $x = -2$

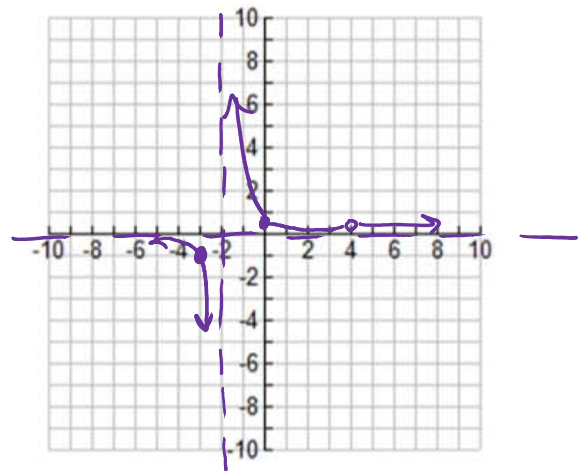
H.A.:  $y = 0$

x-intercept: None

y-intercept:  $(0, 1/2)$

Hole:  $(4, 1/6)$

Extra point:  $(-3, -1)$



$$6. \quad z(x) = \frac{x+2}{-3x^2-5x+2} = \frac{\cancel{x+2}}{\cancel{(x+2)}(-3x+1)} = \frac{-1}{3x-1}$$

V.A.:  $x = +1/3$

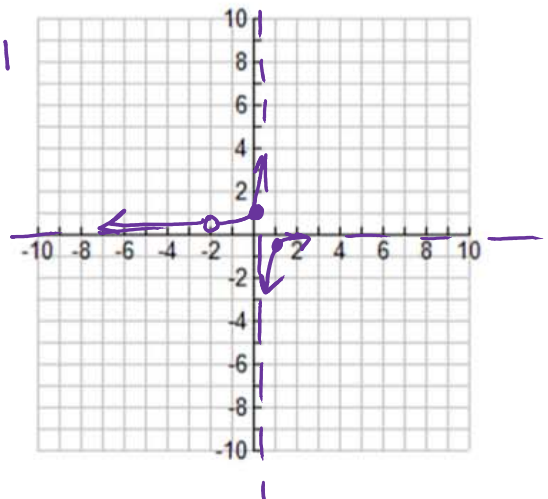
H.A.:  $y = 0$

x-intercept: None

y-intercept:  $(0, +1)$

Hole:  $(-2, 1/7)$

Extra point:  $(1, -1/2)$



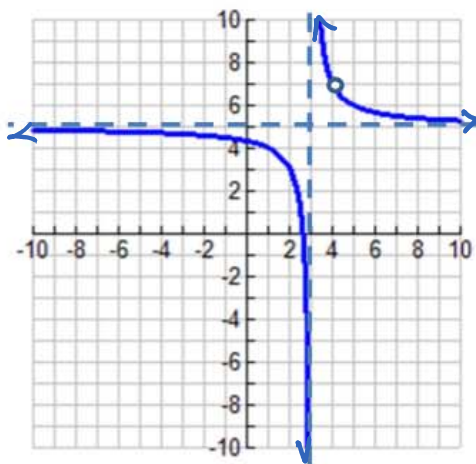
7. Compare and contrast the functions  $m(x) = \frac{4(x-1)}{(x-1)(x+3)}$  and  $m(x) = \frac{4}{x+3}$ .

Has a hole  
at (1,1)

Has no hole

otherwise exactly the same

Use the graph of  $g(x)$  below to answer the following questions.



8.  $\lim_{x \rightarrow \infty} g(x) = 5$

9.  $\lim_{x \rightarrow -\infty} g(x) = 5$

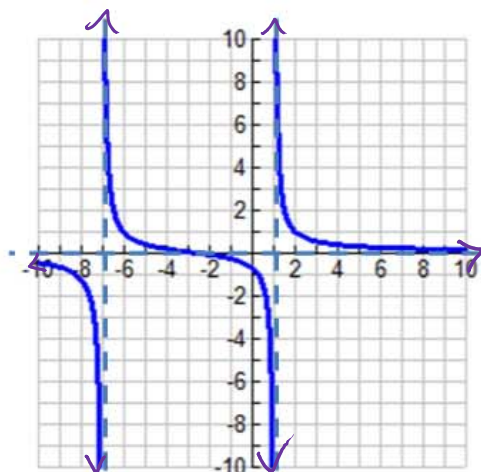
10.  $\lim_{x \rightarrow 3^+} g(x) = \infty$

11.  $\lim_{x \rightarrow 3^-} g(x) = -\infty$

12.  $\lim_{x \rightarrow 4^-} g(x) = 7$

13.  $\lim_{x \rightarrow 4^+} g(x) = 7$

Use the graph of  $j(x)$  below to answer the following questions.



14.  $\lim_{x \rightarrow -\infty} j(x) = 0$

15.  $\lim_{x \rightarrow \infty} j(x) = 0$

16.  $\lim_{x \rightarrow -7^-} j(x) = \infty$

17.  $\lim_{x \rightarrow -7^+} j(x) = -\infty$

18.  $\lim_{x \rightarrow 1^-} j(x) = -\infty$

19.  $\lim_{x \rightarrow 1^+} j(x) = \infty$

Use  $t(x) = \frac{(x-2)(5-x)}{(x+3)(x-2)}$  to answer the following questions.

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

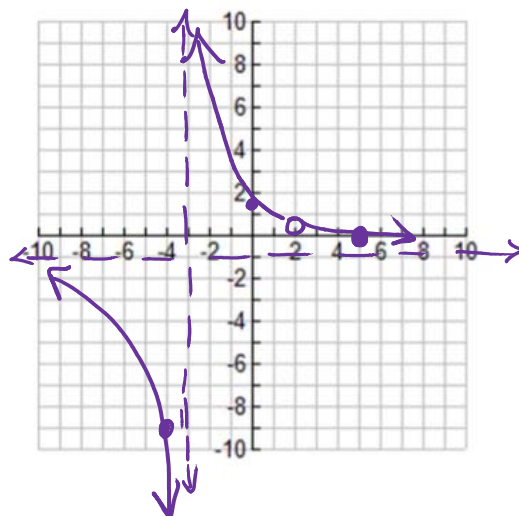
21.  $\lim_{x \rightarrow \infty} t(x) = -1$

22.  $\lim_{x \rightarrow 3^-} t(x) = -\infty$

23.  $\lim_{x \rightarrow 3^+} t(x) = \infty$

24.  $\lim_{x \rightarrow 2^+} t(x) = 3/5$

25.  $\lim_{x \rightarrow 2^-} t(x) = 3/5$



#53

Give an example of a rational function that satisfies the given conditions.

Real zeroes: -2, -1, 1, 2  $x$ -int

Vertical asymptote: none

Horizontal asymptote:  $y = 3$

$$f(x) = \frac{3(x+2)(x+1)(x-1)(x-2)}{x^4 + 1}$$

#54

Given an example of a rational function that satisfies the given conditions.

Real zeroes: none

Vertical asymptotes:  $x = 4$

Horizontal asymptote:  $y = -2$

$$g(x) = -2 \frac{(x^2 + 71)}{(x-4)^2}$$