

4.4 day 1

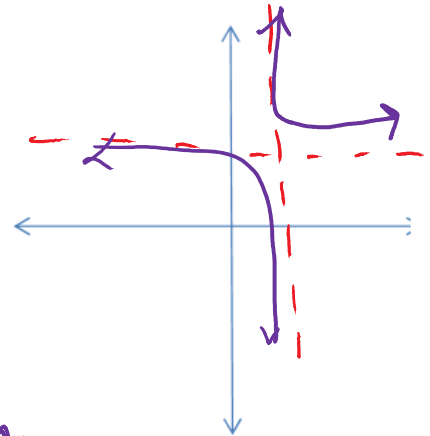
Friday, December 2, 2016 12:26 PM

Algebra 2 Trig H

Name:

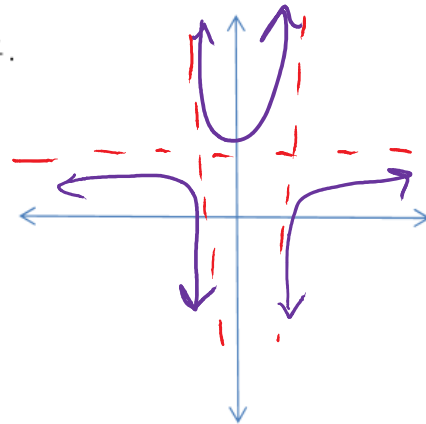
4.4 Graphs of rational functions

1. Using your calculator, graph $g(x) = \frac{3x-5}{x-2}$.

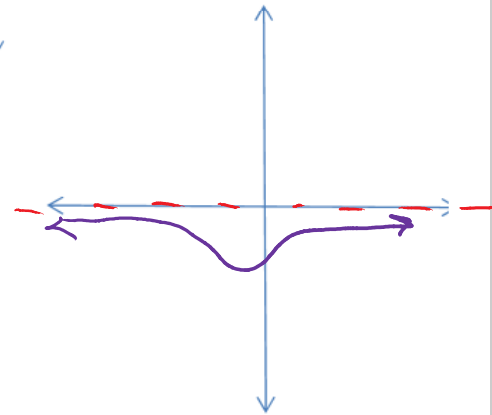


2. Using your calculator, graph $f(x) = \frac{x^2-x-12}{x^2-x-2}$.

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



3. Using your calculator, graph $q(x) = \frac{x-6}{x^2+2}$.



Part I. Without using your calculator, identify the domain of each function.

4. $h(x) = \frac{4}{x}$

$x \neq 0$

5. $j(x) = \frac{4-x}{x^2+5x-6}$

$(x+6)(x-1)$

$x \neq -6, 1$

6. $m(x) = \frac{-x^2-3x+10}{x^2+5}$

\mathbb{R}

7. $k(x) = \frac{x^2+x-6}{x^2-x-12}$

~~$(x+3)(x-2)$~~

~~$(x-4)(x+3)$~~

$x \neq -3, 4$

Note: check when denom = 0

Part II. Without using your calculator, identify the x and y intercepts of each function.

$$8. g(x) = \frac{x-5}{x-2}$$

$$(0, 5/2)$$

$$(5, 0)$$

$$9. f(x) = \frac{(x-4)(x+3)}{x^2-x-2}$$

$$(0, 6)$$

$$(4, 0) + (-3, 0)$$

$$10. j(x) = \frac{4-x}{x^2+5x-6}$$

$$(0, -2/3)$$

$$(4, 0)$$

$$11. m(x) = \frac{-1(x^2+3x-10)}{-1(x+5)(x-2)} = \frac{-x^2-3x+10}{x^2+5}$$

$$(0, 2)$$

$$(-5, 0) + (2, 0)$$

Note: set num = 0 after factoring

Part III. Without using your calculator, identify the vertical asymptotes of each function.

$$12. m(x) = \frac{-x^2-3x+10}{x^2+5}$$

None

$$13. g(x) = \frac{x-5}{x-2}$$

$$x = 2$$

$$14. j(x) = \frac{4-x}{x^2+5x-6}$$

$$(x+6)(x-1)$$

$$x = -6, 1$$

Note: when denom = 0

Part IV. Without using your calculator, identify the horizontal asymptotes of each function.

$$15. j(x) = \frac{4-x}{x^2+5x-6}$$

$$y = 0$$

$$16. m(x) = \frac{-x^2-3x+10}{x^2+5}$$

$$y = -1$$

$$17. m(x) = \frac{7x^3-5x+8}{x^2+5}$$

NO H.A.

Note: same degree in num + denom \rightarrow \div coefficients
 degree H.A. $y = 0$ bigger degree degree NO H.A.

Part V. Without using your calculator, find one coordinate on the graph that is not the x or y intercepts.

$$18. m(x) = \frac{-x^2-3x+10}{x^2+5}$$

$$m(1) = \frac{-1^2-3 \cdot 1+10}{1^2+5} = \frac{6}{6} = 1 \quad (1, 1)$$

19. Graph $h(x) = \frac{x-4}{x+5}$ after finding characteristics of the rational function.

Vertical Asymptotes:

$$x = -5$$

Horizontal Asymptote:

$$y = 1$$

x-intercept:

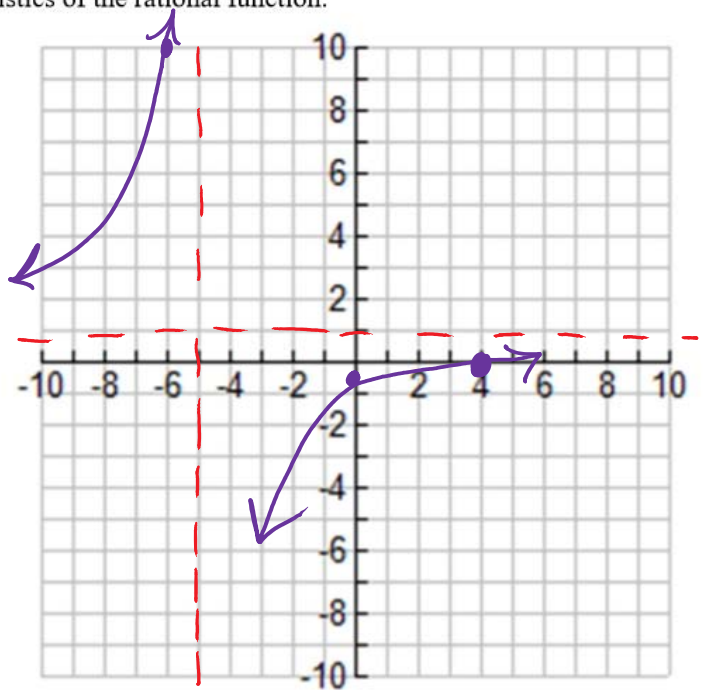
$$(4, 0)$$

y-intercept:

$$(0, -4/5)$$

Extra point:

$$h(-6) = \frac{-6-4}{-6+5} = \frac{-10}{-1} = 10$$



20. $k(x) = \frac{2x-7}{6-x}$

Vertical Asymptotes:

$$x = 6$$

Horizontal Asymptote:

$$y = -2$$

x-intercept:

$$(7/2, 0)$$

y-intercept:

$$(0, -7/6)$$

Extra point:

$$k(8) = \frac{16-7}{6-8} = \frac{9}{-2}$$

