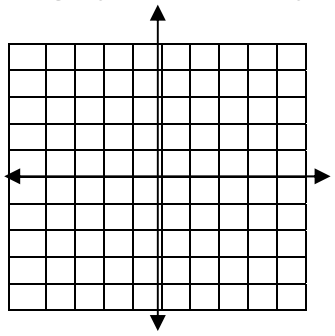
College Algebra
Rational Functions
Review
When graphing, show any asymptotes as dotted lines.

1. $y = \frac{1}{x+3}$

What is the domain of this function?

Graph on your graphing calculator and roughly show what you see:



2-3. Name any vertical asymptotes.

2. $f(x) = \frac{-5x}{x-4}$

3. $f(x) = \frac{x^2-4x-5}{x+1}$

4-6. Name any horizontal asymptotes.

4. $f(x) = \frac{3x+5}{x+4}$

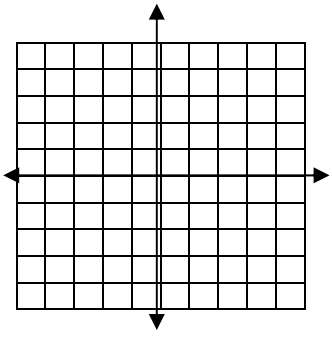
5. $f(x) = \frac{x^3+3}{x^4-5}$

6. $f(x) = \frac{x^3+4}{x}$

7. Find the zeros of this function:

$y = \frac{x^2-49}{x+5}$

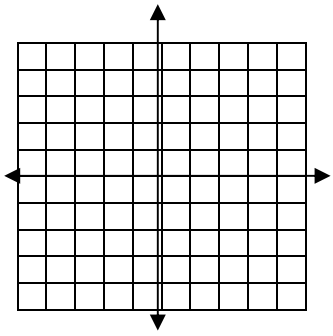
8. Graph $y = \frac{3x-6}{x+4}$. (May use calculator but include the zero and h. and v. asymptotes)



Use the graph to write the answer to $\frac{3x-6}{x+4} > 0$

9. $y = \frac{x+2}{x^2-x-6}$

This graph has a hole in it. Your graphing calculator will not show the hole. Graph this, showing the vertical asymptote and the hole.



10-11 Solve these equations:

10. $-\frac{7}{x^2}-\frac{8}{x}=1$

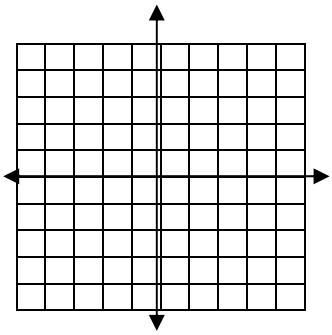
11.

$$\frac{x}{x+2}+\frac{x}{x-2}=\frac{8}{x^2-4}$$

12. y varies inversely as x^2. If x = 12, y = 5.
Find y if x = 3.

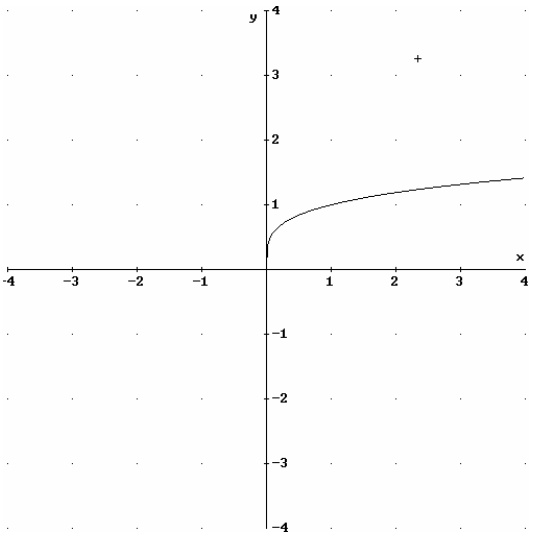
13. Volume of a gas varies directly as temperature and inversely as its pressure. When V = 217 in^3, t = 310 degrees and p = 20 $lb/in^{2.}$
Find V when t = 340 degrees and p = 20 lb/ in^2.

14. Graph on your graphing calculator and show below.
$y = -\sqrt{3-x}$.



Now name the domain:
and range:

15. Here's the graph of $y = \sqrt[4]{x}$.



What change would it make in the above graph if $y = \sqrt[4]{x} - 2$? Choose answers from up 2, down 2, left 2, right 2.

16-18. Solve analytically (show work).

16. $\sqrt{4x-3} = 2x-3$ (Hint: check your answers.)

17. $\sqrt[3]{x^2 - 3x} = \sqrt[3]{x}$

18. $\sqrt{3x+1} - \sqrt{x-4} = 3$

19. Solve analytically (show work). Then use graph to answer part b. (use your calculator but you don't have to show the graph on this page)

a. $-\sqrt{x+6} = x$

b. $-\sqrt{x+6} > x$

20. a. Calculate and round to the nearest hundredth:

$\sqrt[6]{115} \approx$

b. Show work without calculator. (Calculator may be used to check.)

$64^{-\frac{1}{2}} =$