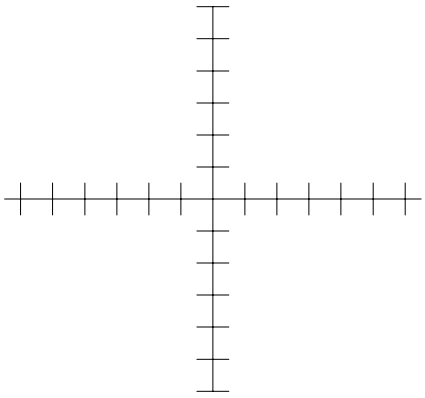
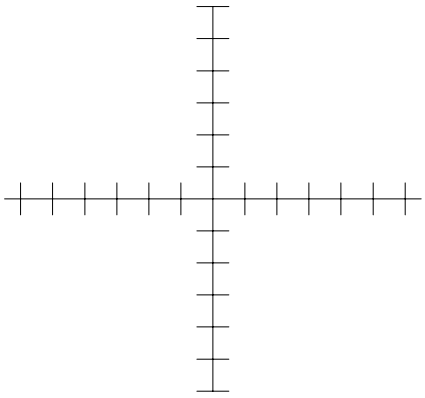
Notes Sections P1 and P2 GRAPHING OF LINES & PARABOLAS, TRIG REVIEW

Pg. 8 #12 Graph $y = \sqrt{x+2}$



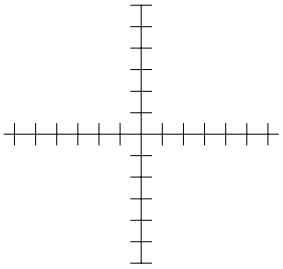
Graph $y = 3x^2 - 6x + 4$

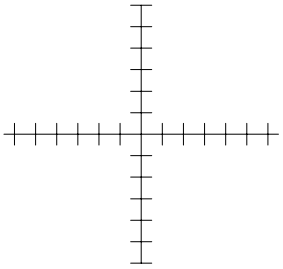


Types of Symmetry:

- With respect to the origin if (x, y) and $(-x,-y)$ are both on the graph.
- With respect to the x-axis if (x, y) and $(x,-y)$ are both on the graph.
- With respect to the y-axis of (x, y) and $(-x, y)$ are both on the graph.

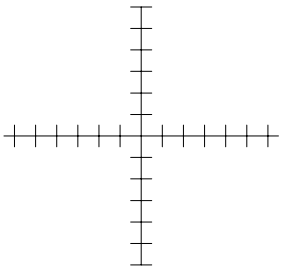
Examples:



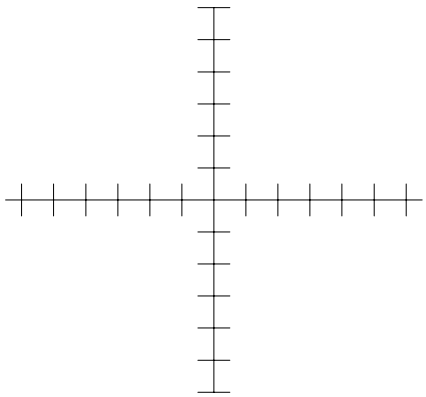


pg. 8 #32 Check $xy^2 = -10$ for symmetries.

Solve: $\begin{cases} x^2 + y^2 = 25 \\ x + y = 1 \end{cases}$



page 9 #50 Graph $y = \sqrt{9 - x^2}$



slope $m = \frac{rise}{run} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\Delta y}{\Delta x}$, where Δ = change

Forms of lines:

slope-intercept	$y = mx + b$
point-slope	$y - y_1 = m(x - x_1)$
general	$ax + by + c = 0$

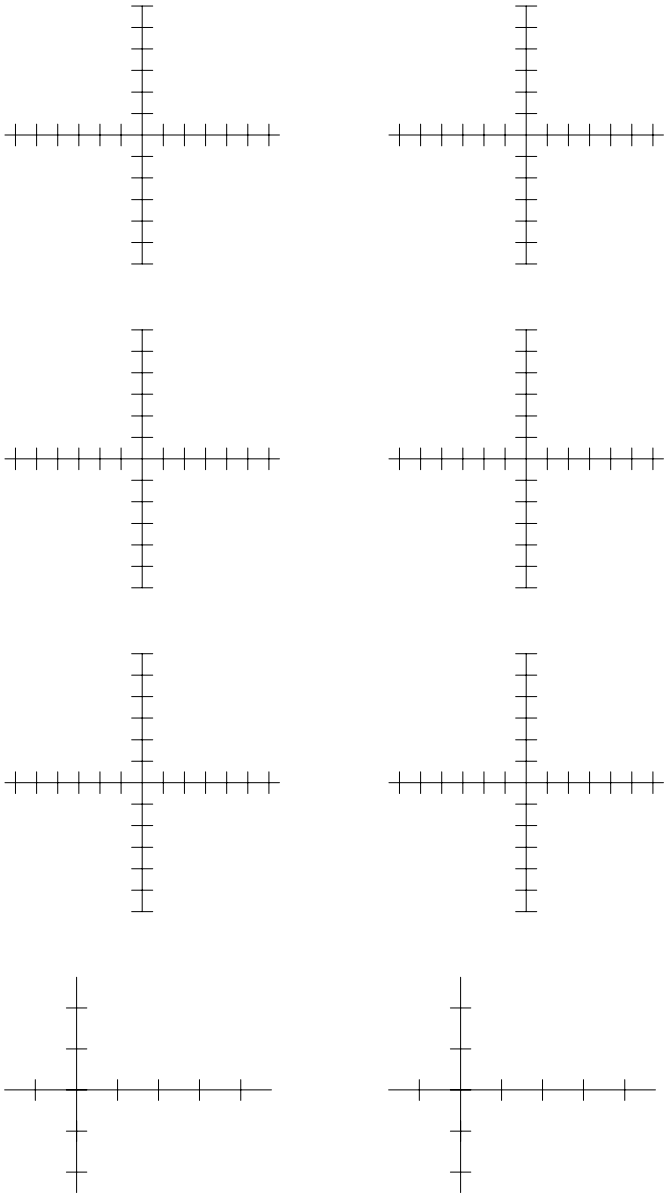
Find the equation of the line through $(-2,4)$ which is perpendicular to $4x - 3y = 7$.

The distance from the point (x_1, y_1) to the line $Ax + By + C = 0$ is given by $d = \frac{|Ax_1 + By_1 + C|}{\sqrt{A^2 + B^2}}$.

Find the distance from $(1,-2)$ to $4x - 3y = 8$.

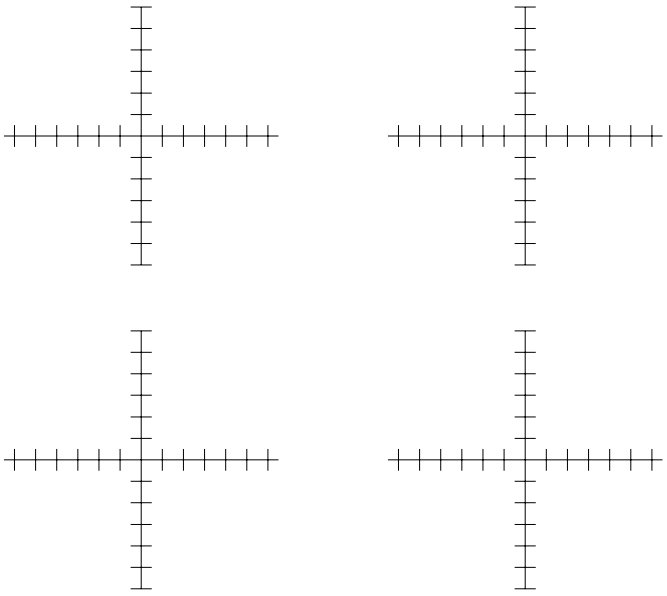
Page 18 #80 A small business purchases a piece of equipment for \$875. After 5 years the equipment will be outdated, having no value. Write a linear equation giving the value **y** of the equipment in terms of time **x**, $0 \le x \le 5$.

You are responsible for the following types of graphs:



You are responsible for the following types of transformations of a function (**c>0**):

Original graph:	$y = f(x)$
Horizontal shift c units to the **right**:	$y = f(x - c)$
Horizontal shift c units to the **left**:	$y = f(x + c)$
Vertical shift c units **downward**:	$y = f(x) - c$
Vertical shift c units **upward**:	$y = f(x) + c$
Reflection about the x-axis:	$y = -f(x)$
Reflection about the y-axis:	$y = f(-x)$
Reflection about the origin:	$y = -f(-x)$



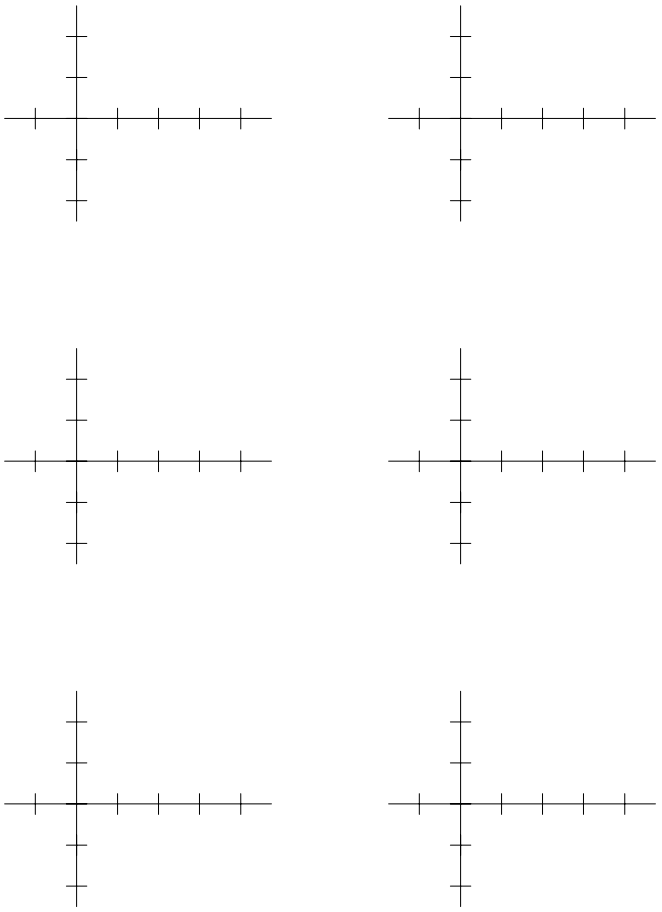
You are responsible for knowing how to find the values of the six trig functions at each of the standard values.

Find $\cos(210°)$

Find $\sec\left(\frac{-5\pi}{4}\right)$

You are responsible for the Pythagorean identities, sum and difference of two angles formulas, as well as the double and half-angle formulas. (See your formula page)

You are responsible for the graphs of the six trig functions:



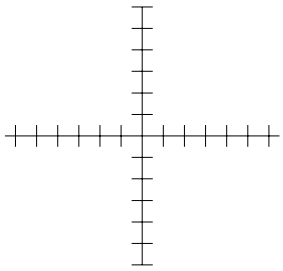
Solve: $2\sin^2\vartheta = 1$

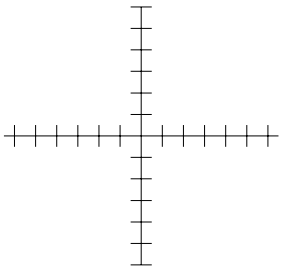
Solve: $2\cos^2\vartheta - \cos\vartheta = 1$

Inequality	Interval Notation	Graph
$x < 2$		
$x \le 2$		
$x > 3$		
$x \ne 3$		
$2 \le x < 3$		
$x < -1$ or $x \ge 5$		

- A **function** is a rule that assigns a y-value to an x-value. The **domain** is the set of x-values that can possibly go into a function. The **range** is the set of all possible resulting y-values.
- A function is **one-to-one** if every y has a unique x. (I.e., it passes both the vertical line test and a horizontal line test.)
- A function is **onto** if its range is all of y.
- A function is **even** if $f(x) = f(-x)$ for all x.
- A function is **odd** if $f(-x) = -f(x)$ for all x.

How can you tell if something is a function?
1. If graphed, apply the Vertical Line Test.
2. If given the equation, see if it can be solved for y without using radicals, absolute values or the $\pm$ symbol.



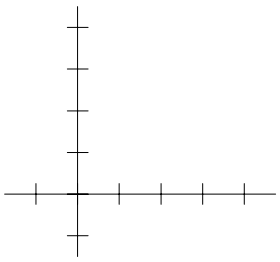


In the first graph, the vertical line hits in 2 places. Each x can only have one y value as its partner. Note that each x is assigned to a single y. (The converse is not true, however, as you can see in the second graph.)

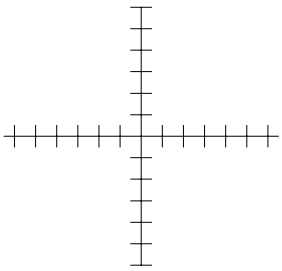
examples:
$x^2 + y = 7x + 2$ can be solved for y. It is a function.
$|y + 3| = 2x$ is not a function. (y is inside the absolute values.)

examples:

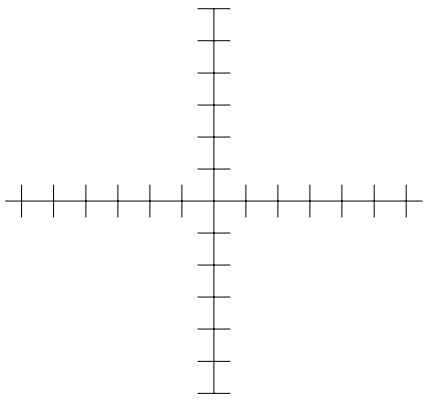
$f(x) = \sqrt{x}$



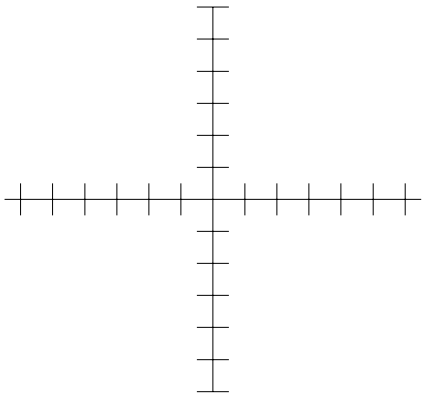
$f(x) = x^3$



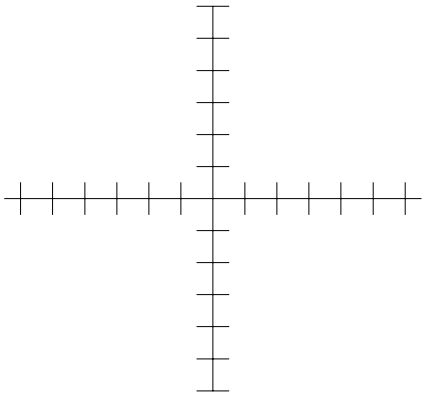
Graph: $f(x) = \begin{cases} |x|, & x < 0 \\ \sin x, & x \ge 0 \end{cases}$



Sketch: $y = -3(x+2)^2(x-1)^2(x+4)$



Graph: $y = \dfrac{x+3}{x-2}$



Guidelines for Horizontal Asymptotes

1. If the degree of the numerator is *less* than the degree of the denominator, then the x-axis is a horizontal asymptote.
2. If the degree of the numerator *equals* the degree of the denominator, then the **ratio of the leading coefficients** is the horizontal asymptote.
3. If the degree of the numerator is *greater* than the degree of the denominator, then there is no horizontal asymptote.

A vertical asymptote occurs where the denominator is zero.
An x-intercept occurs when the numerator equals zero.

Composite Functions:

Given $\begin{cases} f(x) = 2x^2 - 1 \\ g(x) = 3x^2 + 2 \end{cases}$, find the following:

a. $f \circ g(x)$

b. $g \circ f(x)$

problems - pages 27-30

26. Given $f(x) = \begin{cases} x^2 + 2, & x \le 1 \\ 2x^2 + 2, & x > 1 \end{cases}$, find each:

a. $f(-2)$

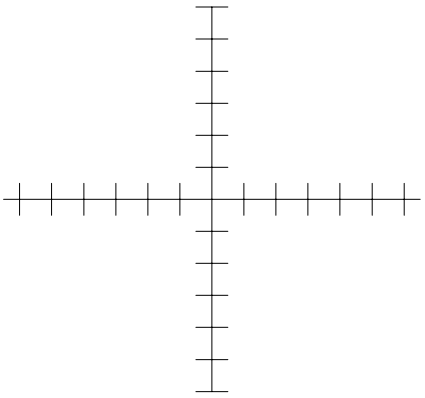
b. $f(0)$

c. $f(1)$

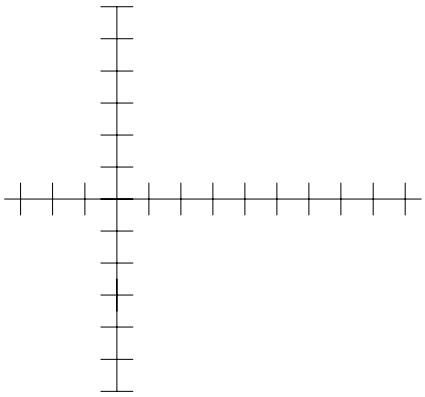
d. $f\left(s^2 + 2\right)$

12. Given $f(x) = x^3 - x$, find $\dfrac{f(x) - f(1)}{x - 1}$

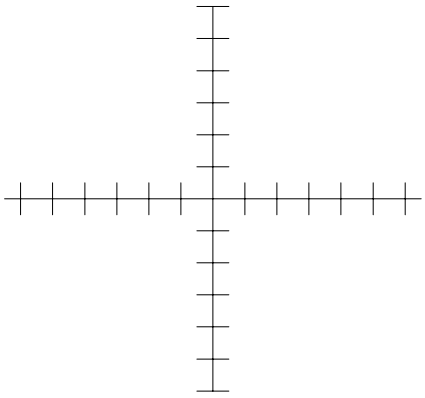
32. Graph $f(x) = \frac{1}{2}x^3 + 2$



36. Sketch $h(\vartheta) = -5\cos\left(\frac{\vartheta}{2}\right)$



34. Sketch $f(x) = x + \sqrt{4 - x^2}$



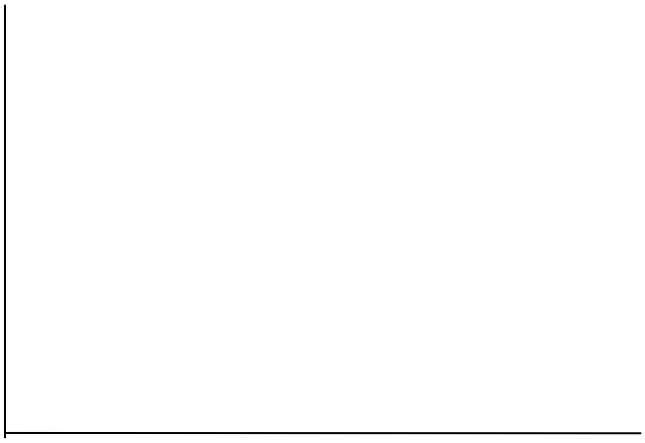
57. Given $f(x) = \sqrt{x}$ and $g(x) = x^2 - 1$, find each:

a. $f(g(1))$ b. $g(f(1))$

c. $g(f(0))$ d. $f(g(-4))$

e. $f(g(x))$ f. $g(f(x))$

A student who commutes 27 miles to attend college remembers, after driving a few minutes, that a term paper that is due has been forgotten. Driving faster than usual, the student returns home, picks up the paper, and once again starts toward school. Sketch a possible graph of the student's distance from home as a function of time.



68. Determine whether $f(x) = \sqrt[3]{x}$ is even, odd, or neither.

94. A right triangle is formed in the first quadrant by the x- and y- axes and the line through the point $(3,2)$. Write the length **L** as a function of x.