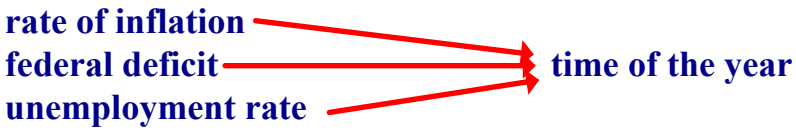
B.2 - Graphs of Equations

 **What will you learn?** 

- **To sketch graphs of equations by point plotting**
- **To graph equations using a graphing calculator**
- **To use graphs of equations to solve real-life problems**

Equations - show the relationships between 2 quantities

Examples



Example 1 - Determining Solution Points

Determine whether the folowing points lie on the graph of $y = 10x - 7$

a.) $(2, 13)$

b.) $(-1, -3)$

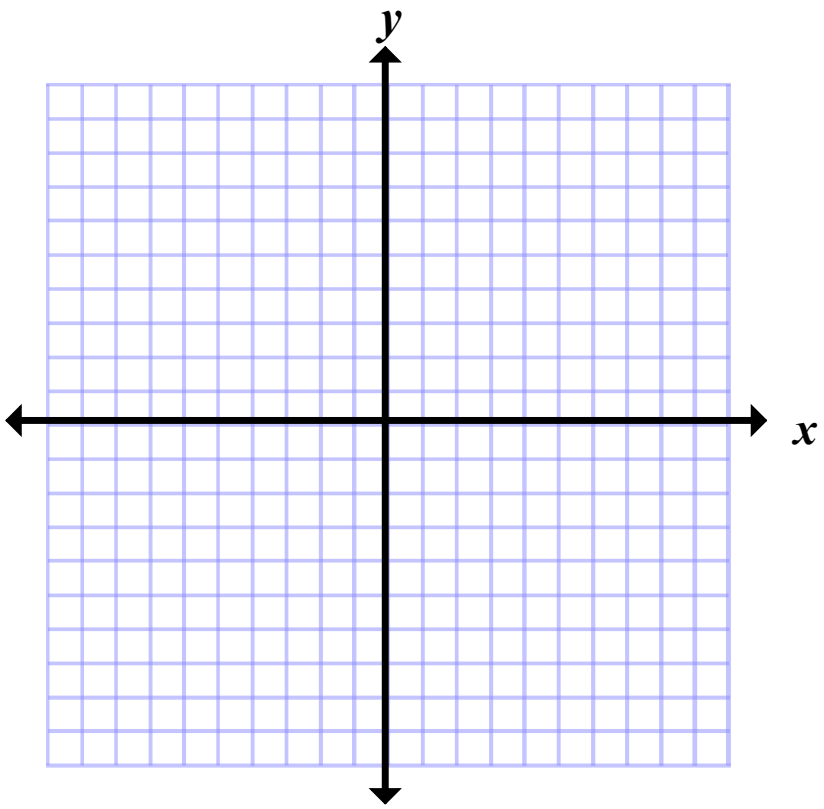
See p. A43; exercise 3

Example 2 - Sketching a Graph by Point Plotting

Use point-plotting & graph paper to sketch the graph of $3x + y = 6$

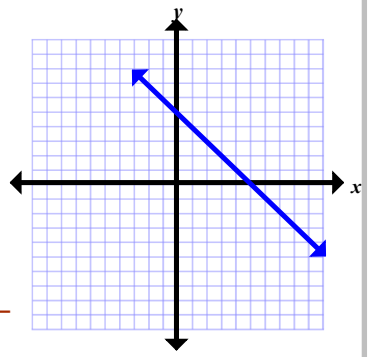
First, get *y* on one side all by itself!

x	y
-1	
0	
1	
2	
3	



See p. A43; exercise 7

What are INTERCEPTS ????



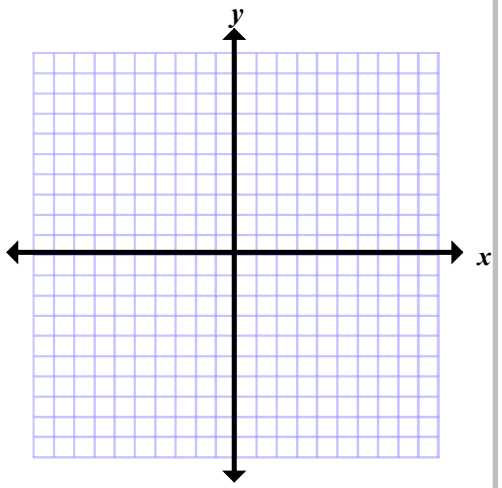
What is the value of *x* at the *y*-intercepts _____

What is the value of *y* at the *x*-intercepts _____

Example 3 - Sketching a Graph by Point Plotting

Sketch the graph of $y = x2 - 2$

x	*y*
-2	
-1	
0	
1	
2	
3	



What is the name of the curve you sketched in this problem?

See p. A43; exercise 9

Using a Graphing Calculator

Graphing Equations

1. Get *y* on left side by itself
2. Enter equations into **y =**
3. Check **WINDOW**
   must show all important features of the graph
3. **Graph**

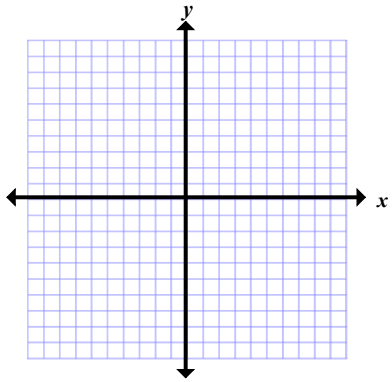
Example 4 - Using a Graphing Calculator to Graph an Equation

$$2y + x3 = 4x$$

y =

WINDOW

TABLE



See p. A44; exercise 39

Standard Viewing Window → Rectangular Screen → does not give a true geometric perspective

perpendicular lines don't appear perpendicular
circles don't appear circular

Square Setting → helps correct this

Example 5- Using a Graphing Calculator to Graph a Circle

$$x2+y2=9$$

What do you remember about graphing circles???

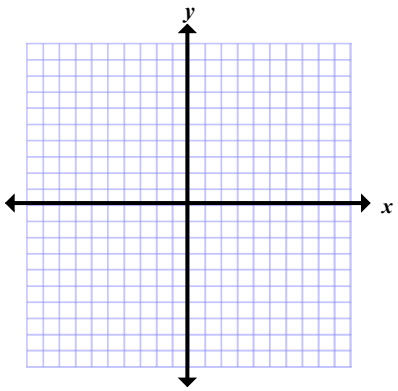
Center_____

Radius_____

Is the graph of a circle a function???_____

To use a calculator...

$y =$



See p. 44; exercise 55

3 Different Approaches to Solving Problems

Numerical Approach

Algebraic Approach

Graphical Approach

Example 6 - Running a Marathon

A runner runs at a constant rate of 4.9 miles per hour.

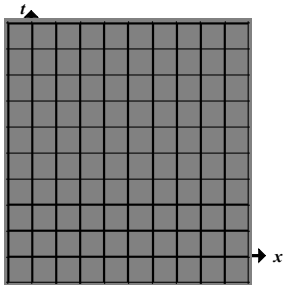
Verbal Model

Equation

a.) Determine how far the runner can run in 3.1 hours
b.) Determine how long it will take to run 26.2 miles

Algebraic Solution

Graphical Solution



See p. A45; exercise 67

If given *x*....how do you find *y*?

If given *y*...how do you find *x*?

Example 7 - Monthly Wage

$$$

You receive a monthly salary of $2000 plus commission of 10% of sales.

Verbal Model

Equation

a.) Sales are $x = 1480$ in August. What are your wages for the month?

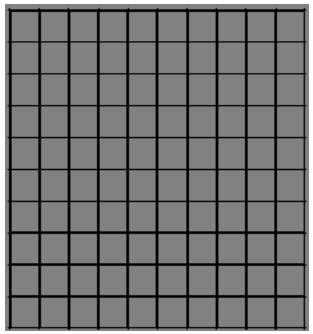
b.) You receive $2225 for september. What are your sales for that month?

Numerical Solution

Graphical Solution

If given x....how do you find y?

If given y...how do you find x?



See p. A46; exercise 72