

Name \_\_\_\_\_

**Algebra 2  
Lesson 2-1**

**Relations and Functions**

During the hot days of summer and fall we see a relationship between the time of day and the temperature. In general what can we say about the temperature as the time of day goes from morning to noon to afternoon?

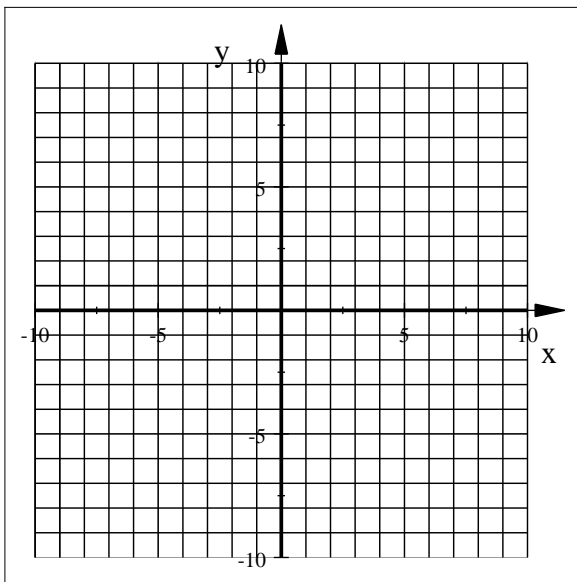
ANS \_\_\_\_\_

If we call time,  $x$  and temperature,  $y$ , we have an **ordered pair**  $(x,y)$  which represents the relationship between the time of day and the temperature it is at that time. When we have a set of data we have a **relation**. And of course you already know that these ordered pairs may be graphed on a graph.

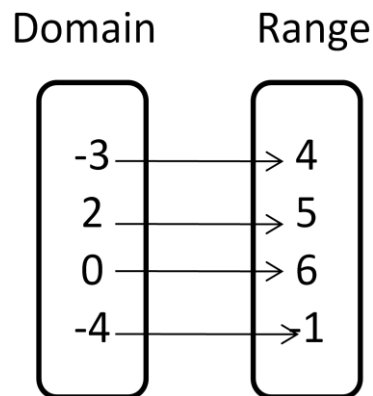
**remember** domain is the  $x$  value and is graphed on the horizontal axis (domain is where you live and ideally you want to live in a flat/horizontal house).

range is the  $y$  value and is graphed on the vertical axis (range, like a mountain range is vertically up in the air).

**Example:** Graph the relation:  $(-3,4), (2,5), (0,6), (-4,-1)$  **remember to label the points!!!**

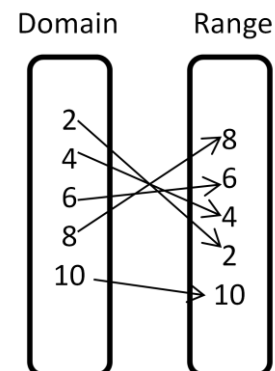
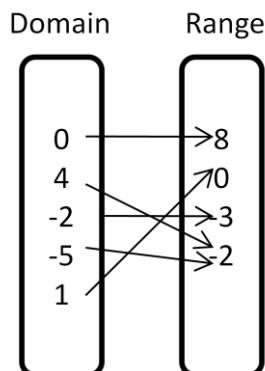
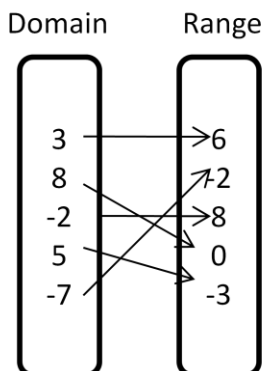


We can also **diagram** the relation:



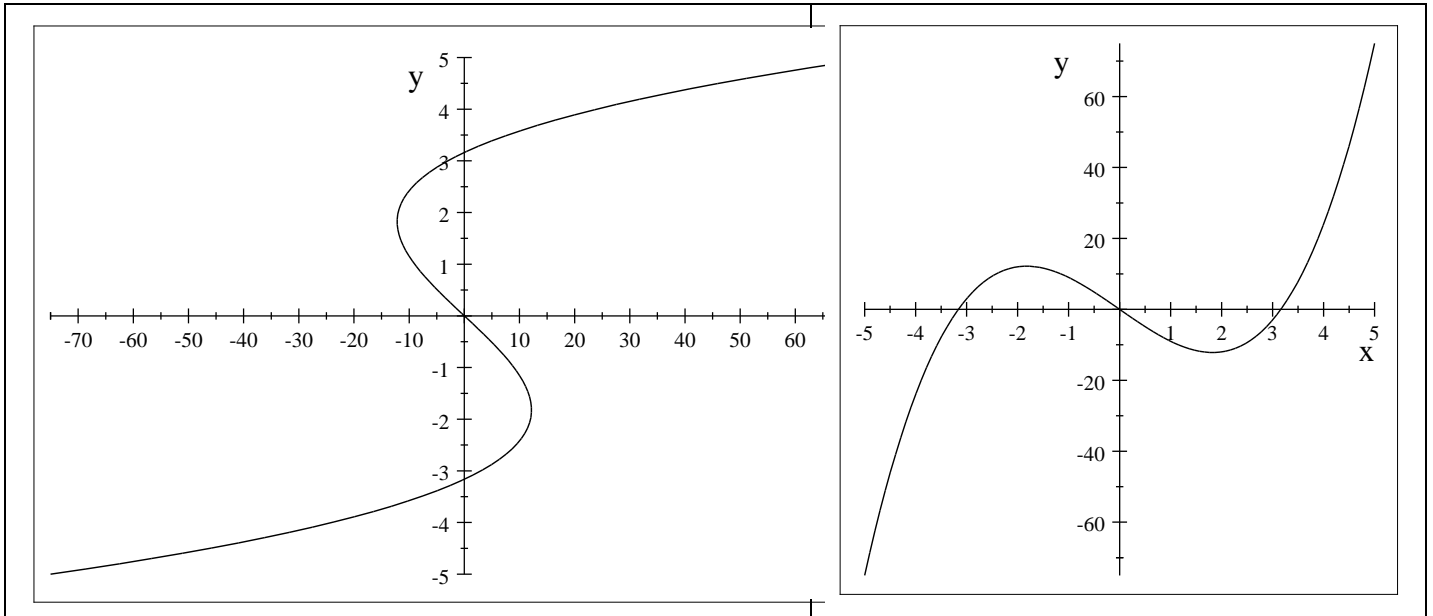
There is a special kind of relation known as a **function**. In a **function each element in the domain is paired with exactly one element in the range.**

Identify the functions:



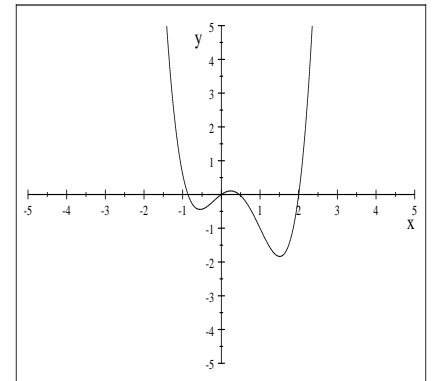
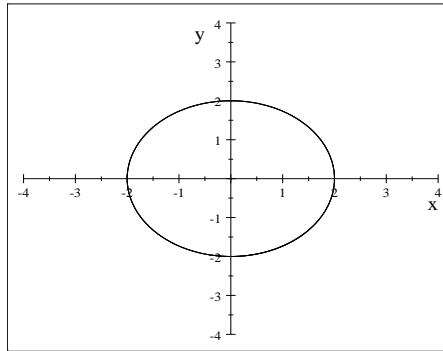
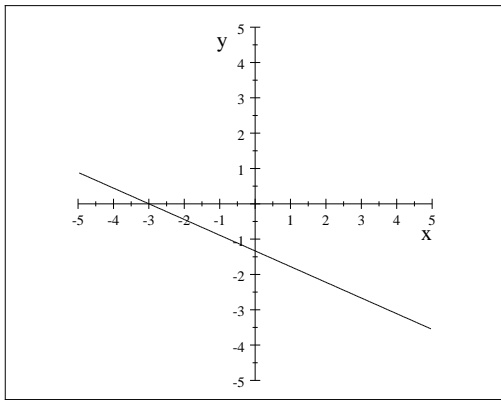
**Algebra 2**  
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Relations, ordered pairs, functions, domains, and ranges!!!! YIKES!! Let's take a look at a graph and decide if it is a function! Which is a function? How can we determine if a graph is a function?



**Vertical line test:** If a vertical line passes through *more than one point* it is **not** a function.

**Example:** Identify which are functions.



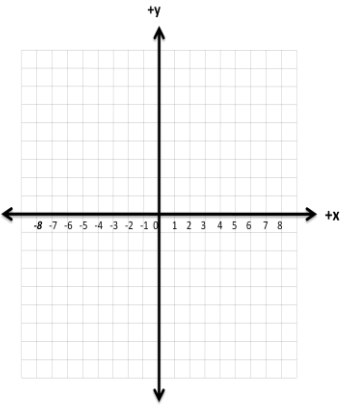
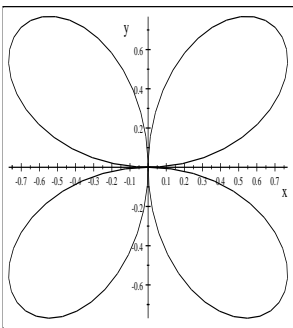
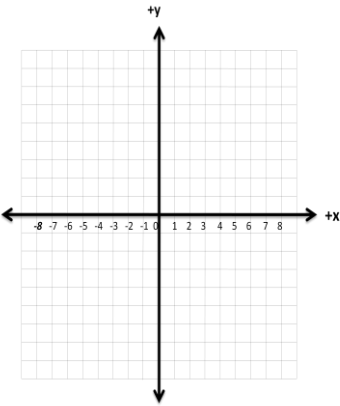
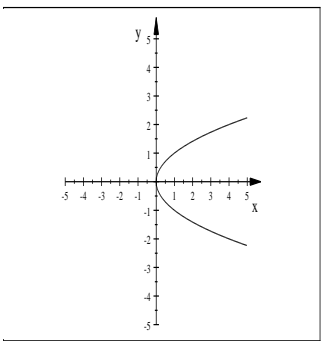
**Function Notation:** The first example discussed, time of day and temperature,. The temperature depends on the time or y depends on x. Early morning and evening are generally cooler and mid-afternoon is the hottest. The variable that is **dependent is y** and the **independent is x**. The **dependent y** is also written as **f(x)**, So,  $y=2x$  is the same as  $f(x)=2x$

**Example:** Solve the following:

$y = 3x - 2, \text{ for } x = 5, -2, \text{ and } 8$	$A = \pi r^2$ ID the dependent and independent variables.
$f(x) = \frac{3}{4}x + 5, \text{ for } x = 8, -4, \text{ and } 6$	$f(x) = 2x + 8, \text{ solve for } x \text{ when } f(x) = 14$
$f(x) = 4x + 8$ as x increases y _____	$f(x) = 3x - 7, \text{ solve for } x \text{ when } f(x) = .7$

Name: \_\_\_\_\_

## Algebra 2 Problem Set 2-1 Relations and Functions

<p>1. graph each relation: (0,4),(3,5), (-2,1),(-4,-3), (-5,0),(-4,-6)</p>		<p>4. Explain why this is not a function? What method do you use to determine this fact?</p>					
<p>2. Write the ordered pairs for the graphed relation.</p>		<p>5. Is <math>y</math> a function of <math>x</math> or is <math>x</math> a function of <math>y</math>? Explain. What is the equation?</p>					
<p>3. For each function, find <math>f\left(\frac{1}{2}\right), f(-3), f(0), f(5)</math></p> <p>a) <math>f(s)=3s-4</math></p> <p>b) <math>f(t) = \frac{1}{3}t - 6</math></p> <p>c) <math>f(x) - 5 = x</math></p> <p>d) <math>f(a) =  3x  + \sqrt{9}</math></p>		<p>6. What is the domain of the relation? Use set notation to state domain.</p> <p><math>\{(1,2), (-3,8), (6,0), (4,2), (6,4),\}</math></p> <p>Does this relation represent a function? Why or why not?</p> <p>Diagram:</p>	<table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: center; border: none;">Domain</th> <th style="text-align: center; border: none;">Range</th> </tr> </thead> <tbody> <tr> <td style="text-align: center; border: 1px solid black; width: 50px; height: 80px; margin: 5px 0;"></td> <td style="text-align: center; border: 1px solid black; width: 50px; height: 80px; margin: 5px 0;"></td> </tr> </tbody> </table>	Domain	Range		
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