

Lesson 8.2- SWBAT determine the domain and range of functions.

Kick off-

1) Solve by completing the square:  $x^2 - 6x - 59 = 0$

$\frac{1}{2}(-6) = -3 \Rightarrow (-3)^2 = 9$   $x^2 - 6x + 9 = 59 + 9$   
 $x^2 - 6x + 9 = 68$   
 $(x-3)(x-3) = 68$   
 $\sqrt{(x-3)^2} = \sqrt{68}$   
 $x-3 = \pm \sqrt{68}$   
 $x = 3 \pm 2\sqrt{17}$

2) Determine if the relation is a function:  $\{(9, -8), (8, -9), (-9, 5), (3, 8), (7, 8)\}$

Function b/c x doesn't repeat.

Definitions:

Ordered Pair- a point  $(x,y)$  from a graph.  
 Relation- When you write it as  $(x,y)$ .  
 Domain- x-values.  
 Range- y-values.  
 Function- when x doesn't repeat!

Relations Expressed as Ordered Pairs  
 Determine if the following relations are functions. Then state the domain and range.

1.  $\{(1, -2), (-2, 0), (-1, 2), (1, 3)\}$   
 Function: NO x repeats!  
 Domain:  $\{1, -2, -1, 1\}$   
 Range:  $\{-2, 0, 2, 3\}$

2.  $\{(1, 1), (2, 2), (3, 5), (4, 10), (5, 15)\}$   
 Function: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_

3.  $\{(17, \frac{15}{4}), (\frac{15}{4}, 17), (15, \frac{17}{4}), (\frac{17}{4}, 15)\}$   
 Function: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_

4.  $\{(-3, \frac{2}{5}), (-3, \frac{3}{5}), (\frac{3}{2}, -5), (5, \frac{2}{5})\}$   
 Function: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_

Relations Expressed as Graphing  
 Write each of the following as a relation, state the domain and range, then determine function.

5.   
 Relation:  $\{(-1, 1), (1, 1), (3, -2), (-2, -2), (1, 0), (3, 3)\}$   
 Domain:  $\{-1, 1, 3, -2, 1, 3\}$   
 Range:  $\{1, -2, 0, 3\}$   
 Function: NO  
 b/c 1 and 3 repeat.

6.   
 Relation: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Function: \_\_\_\_\_

7.

Relation: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Function: \_\_\_\_\_

8.

Relation: \_\_\_\_\_  
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Function: \_\_\_\_\_

Relations Expressed as Mappings  
 Express the following relations as a mapping, state the domain and range, then determine a function.

9.  $\{(2, -1), (0, 3), (5, 4), (-2, 3)\}$   
 \*don't repeat values!  
  
 Domain:  $\{-2, 0, 5\}$   
 Range:  $\{-1, 3, 4\}$   
 Function: NO b/c -2 repeats

10.  $\{(-1, 5), (0, 3), (2, 3), (3, -1)\}$   
 Domain: \_\_\_\_\_  
 Range: \_\_\_\_\_  
 Function: \_\_\_\_\_

11.  $\{(-1, 7), (0, -3), (1, 10), (0, 7)\}$

12.  $\left\{\left(\frac{1}{2}, 2\right), \left(\frac{1}{4}, 2\right), \left(\frac{1}{8}, 2\right), \left(\frac{-1}{2}, 2\right)\right\}$

Domain: \_\_\_\_\_

Domain: \_\_\_\_\_

Range: \_\_\_\_\_

Range: \_\_\_\_\_

Function: \_\_\_\_\_

Function: \_\_\_\_\_