Intermediate Algebra
Unit 2 Review

Name_____
Period____Date_____

Level 1

Determine whether each relation is a function. Explain your reasoning.

1. {(3, -2), (8, 1), (9, 2), (3, 3)}

   No

2. {(7, -1), (6, 2), (2, 6), (5, -1)}

   Yes - no repeating x's... 1 output for every input.

3. {(0, 0), (1, 1), (4, 2), (-1, 1)}

   yes

4. Yes 1 output for every input
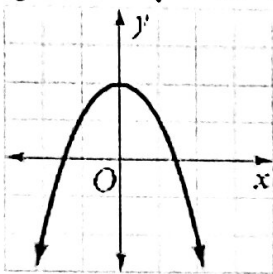
5. no, multiple outputs for one input

6. yes
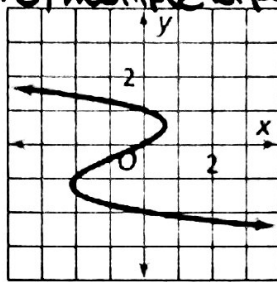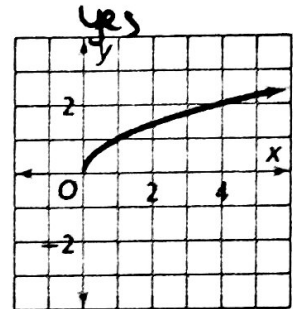
7. yes

x	y
−5	−4
−4	−1
0	3
4	−4

8. NO

x	y
−5	0
−4	−1
0	3
−4	2

9. NO

x	y
−5	1
−4	2
0	3
−5	4

Level 2/3

Define each input and output, determine whether the relation the person is describing is a function. Explain your reason.

10. Sally thinks that months and the holidays that are in that month is a function:

   Input: Month

   Output: Holiday

   Yes or No

   Explain: Some months have more than 1 holiday

11. Ray thinks that holidays and the months that they are celebrated in is a function:

   Input: holiday

   Output: Month

   Yes or No

   Explain: Sometimes Easter is in March or April

12. Jim thinks that students and their id numbers is a function

Input: **Students**

Output: **Id #s**

Yes or No

Explain: **Each student has one ID #**

13. Kelly thinks age of students and their names is a function:

Input: **Age**

Output: **name**

Yes or **No**

Explain: **An age can have many different names.**

14. Sketch a graph that could match this real-world situation where x represents time and y represents the value of your new car:

You buy a brand new car and it loses value very quickly in the first 2 years and then starts losing value more slowly. Label your axes!

| 2.2 | *I understand the meaning of function notation and can evaluate functions for a given input.* |

Level 1

Evaluate each expression given the functions below:

$$f(x) = -3x + 1 \qquad g(x) = x^2 + 7 \qquad h(x) = 2x + 9$$

1. $f(10) = $ **-3(10)+1**

   -29

2. $g(3) = $ **3²+7**

   16

3. $h(-2) = $ **2(-2)+9**

   5

4. $f(4) + h(5) = $

   f(4) = -3(4)+1 = -11

   h(5) = 2(5)+9 = 19

   f(4)+h(5) = 8

5. Find x if $f(x) = 16$

   16 = -3x+1

   15 = -3x

   x = -5

6. Find x if $g(x) = 32$

   32 = x²+7

   25 = x²

   x = ±5

Use the graph to find the following:
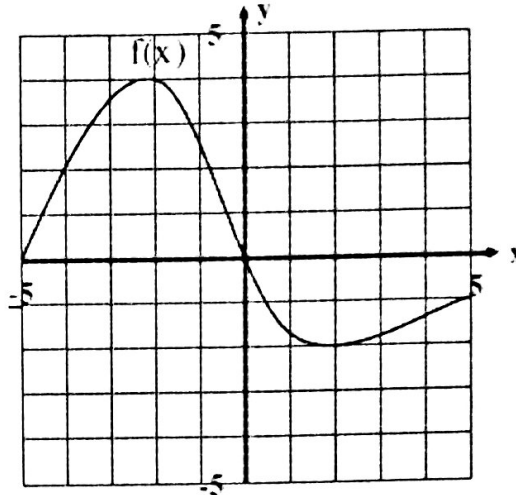
7. $f(5) = -1$

8. $f(-2) = 4$

9. x when $f(x) = 2$

$x = -.75$

10. x when $f(x) = 0$

$x = 0$

Use the table to find the following:

11. $g(1) = 7$

12. $g(2) = 3$

13. x when $g(x) = 1$

$x = 0$

14. x when $g(x) = 3$

$x = 2$

$x = -1$

x	$g(x)$
-1	3
0	1
1	7
2	3

Level 2/3

15. George is starting a lawn mowing service called Happy Lawns. He charges $15 each time he mows your lawn and a one-time sign up charge of $20. This situation can be modeled by the function $c(t) = 15t + 20$ where t represents the times he has mowed your lawn and c represents the cost.

   a. What is $c(5)$ and what does it represent in this situation?

   $c(5) = 15(5) + 20$
   $c(5) = 95$

   This means that after mowing 5 lawns, he has made $95

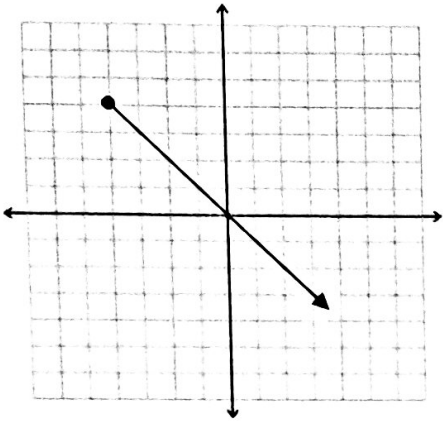   b. What is $c(t) = 110$ and what does it represent in this situation?

   $15t + 20 = 110$
   $ -20 \quad -20$
   $15t = 90$
   $t = 6$

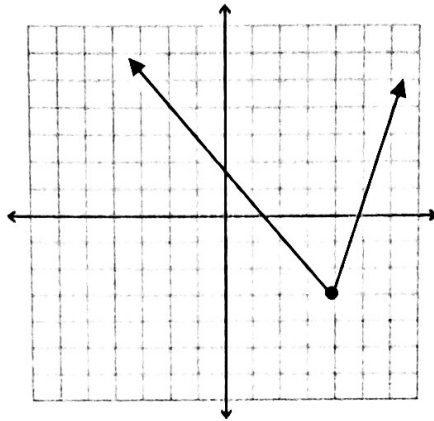   He made $110 after mowing 6 lawns

Level 1

Find the domain and range in questions 1-3.
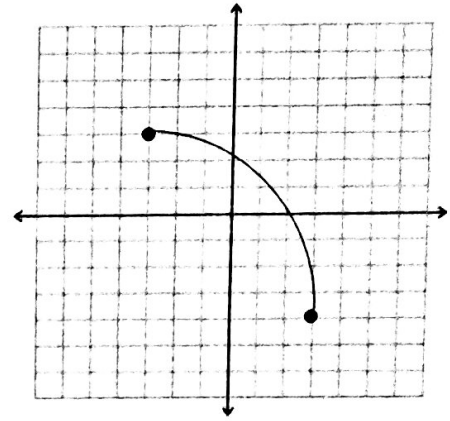
1.

Domain: $X \geq -4$
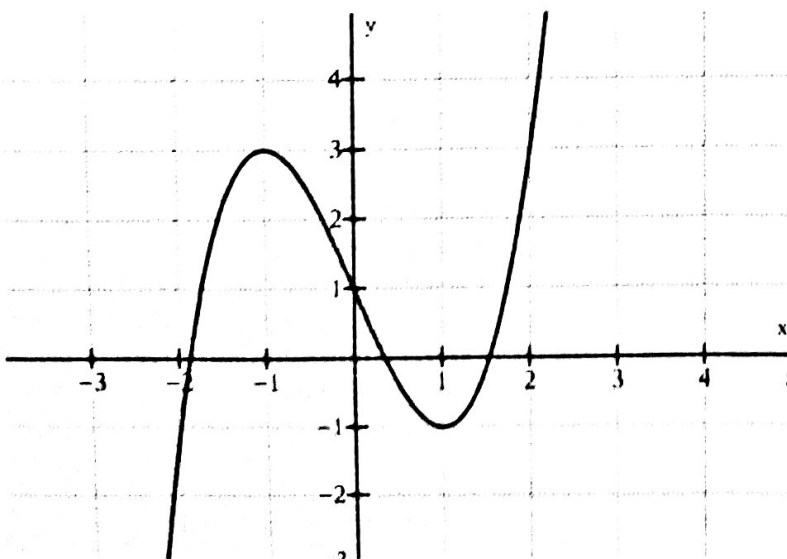
Range: $y \leq 4$

2.

Domain: $\mathbb{R}, -\infty < X < \infty$

Range: $y \geq -3$

3.

Domain: $-3 \leq X \leq 3$
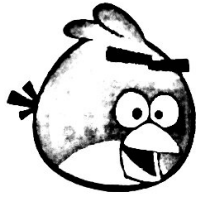
Range: $-4 \leq y \leq 3$

4. Use the graph below to find the following:

a. x-intercept(s) $(-1.9, 0), (.4, 0), (1.55, 0)$

b. y-intercept(s) $(0, 1)$

c. Increasing interval(s) $-\infty < X < -1$, $1 < X < \infty$

d. Decreasing interval(s) $-1 < X < 1$

e. Relative minimum $(1, -1)$

f. Relative maximum $(-1, 3)$

5. The graph below shows the height (in feet) of an angry bird with respect to the time (in seconds).

a. What is the maximum height of the angry bird?

    20ft

b. Determine the interval on which the angry bird's height is increasing.

    0 < X < 5

Increasing from 0 seconds to 5 seconds

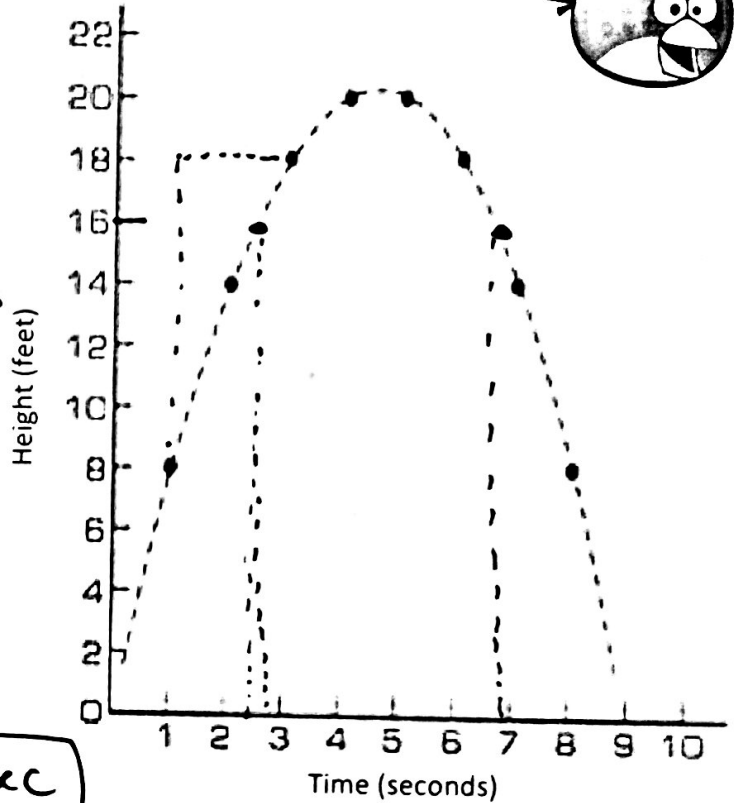c. When is the angry bird at 16 feet?

    2.5 seconds

    7 seconds

d. Explain what the x-intercepts mean in relation to the angry bird.

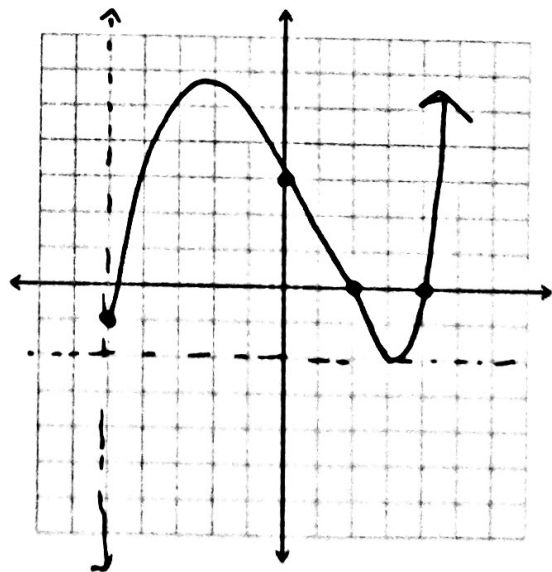   **when he starts on the ground + when he lands on the ground.**

e. What is the rate of change of the angry bird from 1 to 3 seconds?

$$\frac{Rise}{Run} \ \frac{18-8 \ ft}{3-1 \ sec} = \frac{10ft}{2 \ sec} = \boxed{5ft/sec}$$

Height (feet) vs Time (seconds)

6. Sketch a graph that has the following features:
   - a. Has at least one relative maximum
   - b. The Domain is $x \geq -5$
   - c. The Range is $y \geq -2$
   - d. Has a y-intercept at $(0,3)$
   - e. Has x-intercepts at $(2,0)$ and $(4,0)$

Answers may vary