Name: _____

Date: _____

Introduction to Functions

A function relates one amount to other amounts by some mathematical expression [formula]. We use simple one-variable functions in High School where something depends on only one other thing.

Notice how anytime a function (a formula) is stated it should clearly indicate what each symbol means and the associated units. Show work even if trivial

Complete the following questions. Complete the data table, graph the data.

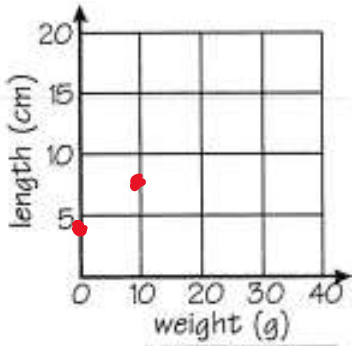
Suppose you suspend weights from a spring. The relationship between the length of the spring and the amount of weight suspended from it is given by the function:

$$L = 0.3w + 4$$

where L is length (cm), and w is weight (g)

LINEAR function

w	L
0	4
10	7
20	
30	
40	



Work Area:

$0.3 \cdot (0) + 4 = 4$
$0.3 \cdot (10) + 4 = 7$

} Evaluate for each given w

Show work!

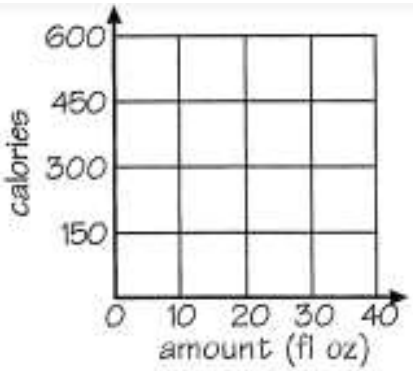
Suppose you order a pitcher of root beer.
The relationship between the number of calories in the root beer and the amount of root beer is given by the function:

Linear Function

$$C = 14b$$

where C is calories, and b is amount (fl oz)

b	C
0	
10	
20	
30	
40	



Work Area:

Show work

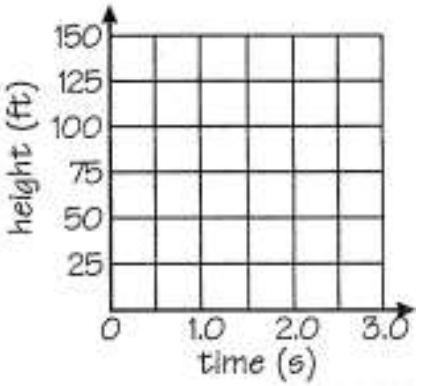
Suppose you are standing on a cliff 144 feet above the ocean surface. You drop a rock.
The relationship between the height of the rock above the water and time since you dropped it is given by the function:

Quadratic Function

$$h = 144 - 16t^2$$

where h is height (ft), and t is time (s).

t	h
0	
0.5	
1.0	
1.5	
2.0	
2.5	
3.0	



Work Area:

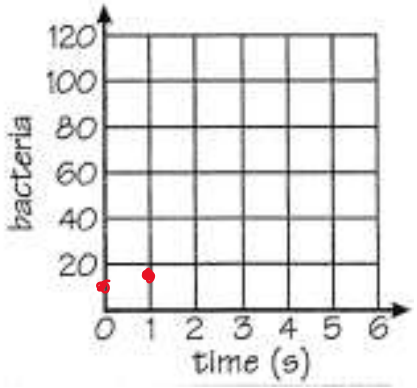
Suppose you observe a colony of bacteria. At first there are 10 bacteria, but the number increases 150% every hour.
The relationship between the total number of bacteria and time is given by the function:

$$n = 10 \cdot 1.5^t$$

Exponential Function

where n is number of bacteria, and t is time (h).
(Round to the nearest whole number.)

t	n
0	10
1	15
2	
3	
4	
5	
6	



WORK AREA: $10 \cdot 1.5^0 = 10$ $10 \cdot 1.5^1 = 15$ (n)

Show work

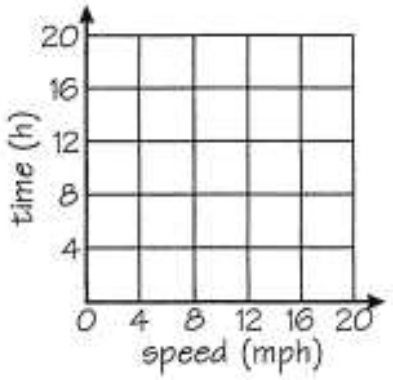
Suppose you plan to ride a bike 36 miles.
The relationship between the time needed to complete the trip and your average speed is given by the function:

$$t = \frac{36}{r}$$

Reciprical Function

where t is time (h), and r is average speed (mph)

r	t
2	
3	
4	
6	
9	
12	
18	



WORK AREA:

You know that speed = distance/time
$r = d/t$
So: $t = d/r = d/36$