

Algebra Unit 3 Test Review –Introduction to Functions

E.I.F.C.7 – Graph functions expressed symbolically and show key features of the graph.

1.) Determine whether the ordered pair is a solution to the equation .

$$y = -3(x^2) + 2$$

a.) (2,-10)

b.) (-1, 3)

$$\begin{aligned} -10 &= -3(2^2) + 2 \\ &= -3 \cdot 4 + 2 \quad \boxed{\text{yes}} \\ -10 &= -12 + 2 \end{aligned}$$

$$\begin{aligned} 3 &= -3(-1)^2 + 2 \\ &= -3(1) + 2 \\ 3 &\neq -3 + 2 \quad \boxed{\text{No}} \end{aligned}$$

2.) Identify the domain and range of each relation. Use a mapping diagram to determine whether the relation is a function.

$$\{(-5, 6), (-4, 3), (1, 3), (3, -3), (4,6)\}$$

Domain:

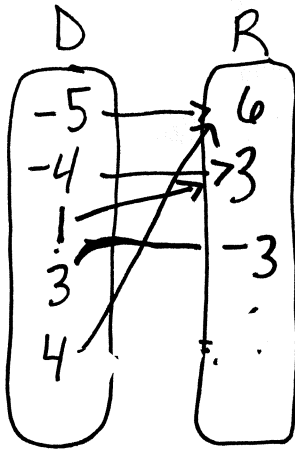
$$\underline{-5, -4, 1, 3, 4}$$

Range:

$$\underline{6, 3, -3}$$

Function:

Yes No
(circle one)



3.) Evaluate the functions $f(x) = 6 - 2^x$, $g(x) = \frac{x}{8} + 10$, and at the given values.

a.) $f(3) = 6 - 2^3$
 $= 6 - 8$

b.) $g(16) = \frac{16}{8} + 10$

$$f(3) = -2 \quad \boxed{(3, -2)}$$

$$\begin{aligned} &= 2 + 10 \\ g(16) &= 12 \quad \boxed{(16, 12)} \end{aligned}$$

c.) $f(1) + g(-24) = \frac{-24}{8} + 10$

$$\begin{aligned} &= 6 - 2 \\ &= 4 + 7 \end{aligned}$$

$$\boxed{11}$$

4.) Name the type of function or family of function (linear function, quadratic function, cubic function, exponential function, etc.) to which each given function belongs. Explain to justify your choice.

a. $h(x) = x^2 - 1$

Type of function: quadratic

How do you know? squared or 2 as the exponent

b. $g(x) = 3^x$

Type of function: exponential

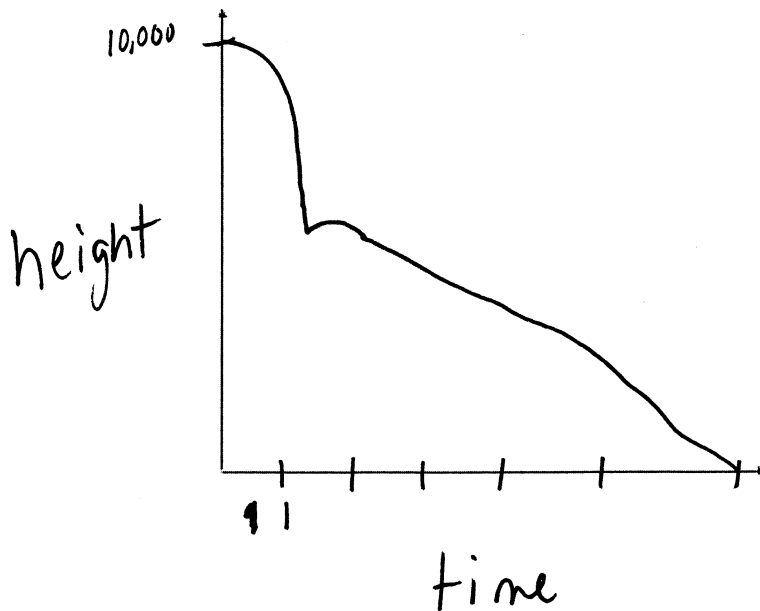
How do you know? "x" is in the exponent

c. $f(x) = 5x - 6$

Type of function: linear

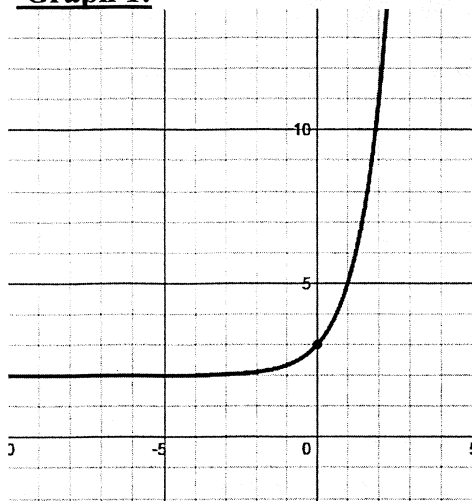
How do you know? only an x no exponent higher than 1

5.) Draw a graph to sketch the following situation: A skydiver exits an airplane at 10,000 ft. She freefalls for 1 minute to 3,500 ft when she opens her parachute. She then flies her parachute to the ground over the next 5 minutes.



6.) Name the type of function or family of function (linear function, quadratic function, cubic function, exponential function, etc.) to which each given function belongs. Explain to justify your choice.

Graph 1:



Graph 1:

a.) Type of function: exponential

b.) How do you know? grows rapidly, has a curve

Key features of the function:

c.) Does the graph have any x-intercepts? No

How many? —

d.) Identify the y-intercept: (0, 3)

e.) Is the graph increasing or decreasing? increasing

f.) Does the graph have a minimum value

of the function? No

If so, what is it? —

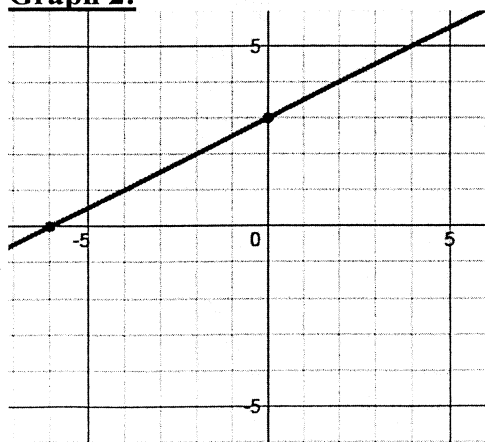
g.) Does the graph have a maximum value

of the function? No

If so, what is it? —

h.) When you look at the left part of the graph, what is the value that all the values of y approach? 2

Graph 2:



Graph 2:

a.) Type of function: linear

b.) How do you know? straight line

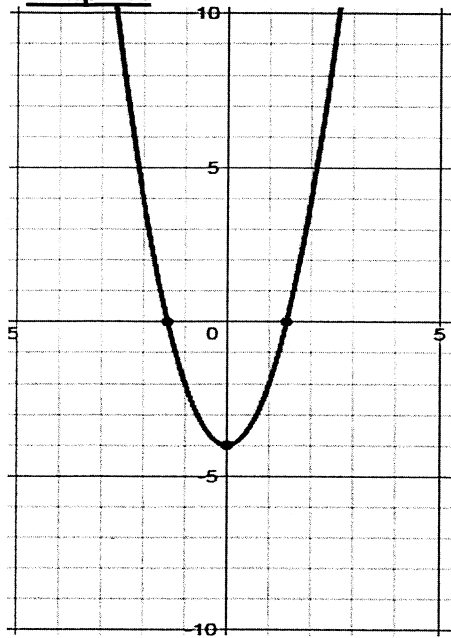
Key features of the function:

c.) Identify the x-intercept: (-6, 0)

d.) Identify the y-intercept: (0, 3)

e.) Is the graph increasing or decreasing? increasing

Graph 3:



Graph 3:

a.) Type of function: quadratic
 b.) How do you know? "U" shaped,
parabola,
change direction

Key features of the function:

c.) Does the graph have any x-intercepts? yes
 How many? 2

d.) Identify the y-intercept: (0, -4)

e.) For x-values that are less than 0, is the graph increasing or decreasing? decreasing

f.) For x-values that are greater than 0, is the graph increasing or decreasing? increasing

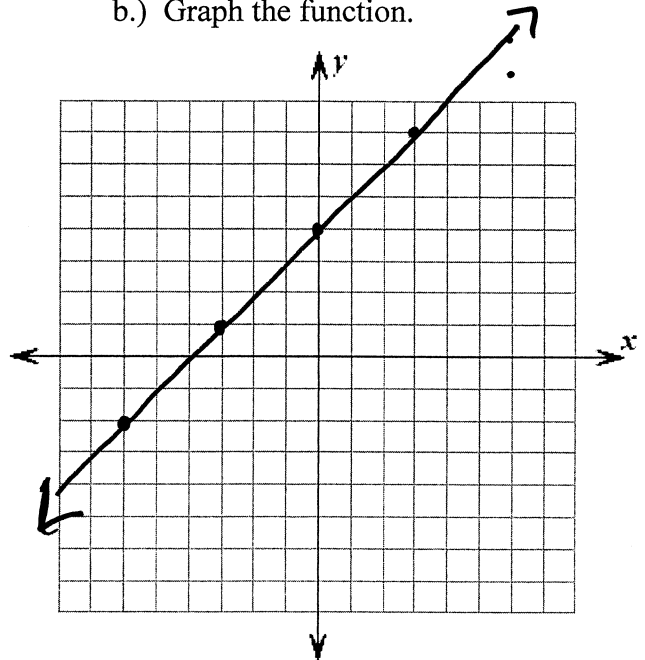
g.) Does the graph have a minimum or maximum value of the function? min
 If so, what is it? (0, -4)

i.) Identify the vertex? (0, -4)

7.) a.) Evaluate the function at the given values.

x	$f(x) = x + 4$	$f(x)$
-6	$= -6 + 4$ $= -2$	$(-6, -2)$
-3	$= -3 + 4$ $= 1$	$(-3, 1)$
0	$= 0 + 4$ $= 4$	$(0, 4)$
3	$= 3 + 4$ 7	$(3, 7)$
6	$= 6 + 4$ $= 10$	$(6, 10)$

b.) Graph the function.



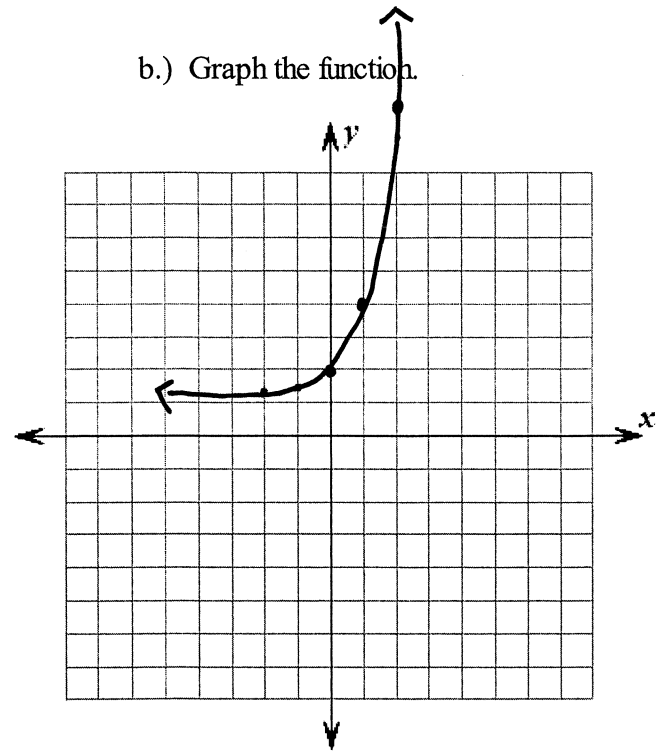
c.) Identify the graph as linear, quadratic, exponential, or other. linear

8.) a.) Evaluate each function at the given values.

x	$h(x) = 3^x + 1$	$h(x)$
-2	$3^{-2} + 1 = \frac{1}{3^2} + 1 = \frac{1}{9} + 1 = 1\frac{1}{9}$	$1\frac{1}{9}$
-1	$3^{-1} + 1 = \frac{1}{3^1} + 1 = \frac{1}{3} + 1 = 1\frac{1}{3}$	$1\frac{1}{3}$
0	$3^0 + 1 = 1 + 1 = 2$	2
1	$= 3^1 + 1$ $3 + 1 = 4$	(1, 4)
2	$= 3^2 + 1$ $9 + 1 = 10$	(2, 10)
3	$= 3^3 + 1$ $27 + 1 = 28$	(3, 28)

c.) Identify the graph as linear, quadratic, exponential, or other. exponential

b.) Graph the function.



9.) a.) Evaluate each function at the given values.

x	$g(x) = -2x^2 + 8$	$g(x)$
-3	$= -2(-3)^2 + 8$ $-2(9) + 8 = -10$	(-3, -10)
-2	$= -2(-2)^2 + 8$ $-2(4) + 8 = 0$	(-2, 0)
-1	$= -2(-1)^2 + 8$ $-2(1) + 8 = 6$	(-1, 6)
0	$= -2(0)^2 + 8$ $0 + 8 = 8$	(0, 8)
1	$= -2(1)^2 + 8$ $-2(1) + 8 = 6$	(1, 6)
2	$= -2(2)^2 + 8$ $-2(4) + 8 = 0$	(2, 0)

c.) Identify the graph as linear, quadratic, exponential, or other. quadratic

b.) Graph the function.

