

## Unit 5 Control

1. (B) If  $f(x) = 4(2.0)^x$  is the population before removal and  $f(x) = 2(2.0)^x$  is how many were removed, then the remaining would be represented by the function  $h(x) = 2(2.0)^x$ .
2. (B) - remember domain is the 'x' value.
- Integer - all counting numbers, zero and negative whole numbers - not A!
  - Real Numbers - Positive or negative + includes fractions + decimals - not C.
  - not D because it doesn't include 0!
3. (A) - Since  $f(x)$  is the same as  $y$  - it means the  $y$ -intercept moves up by 4!

4.

x	$y = 100(0.78)^{3x}$	y
1	$y = 100(0.78)^{3.1}$	47.4
2	$y = 100(0.78)^{3.2}$	22.5
3	$y = 100(0.78)^{3.3}$	10.6
4	$y = 100(0.78)^{3.4}$	5
0	$y = 100(0.78)^{3.0}$	100

About 53%.

5. [A] - the sequence changes as each number is multiplied by 3.

6. [C] - First determine what the y-intercept is by looking at "c" - the last number in each. Since the y-intercept on the graph is -6, you can cross off answer choices B and D.

Full Next, factor choices "A" + "C" to see which x-intercepts match those on the graph.

a.  $x^2 - x - 6 = 0$

$(x+2)(x-3)$

$x+2=0$      $x-3=0$

$-2-2$      $+3+3$

$x=-2$

$x=3$

X-not x-int.

c.  $x^2 + x - 6 = 0$

$(x-2)(x+3)$

$x-2=0$      $x+3=0$

$+2+2$      $-3-3$

$x=2$  ✓

$x=-3$  ✓

7. [A] The dashed line runs across the x-axis, which tells you that's where it started. "k" represents the y-intercept in an exponential function, so just count how many units down until you reach the y-int. of the solid line which is -4.

8. [B] If  $1962=0$ , then  $1969=7$ ,  $1971=9$   
 $1975=13$  and  $1999=37$ . Make a table + plug in the values + solve for v + see which is lowest.

x	$v = 20x^2 - 363.2x + 2500$	v
7	$20(7^2) - 363.2(7) + 2500$	937.6
9	$20(9^2) - 363.2(9) + 2500$	851.2 - lowest
13	$20(13^2) - 363.2(13) + 2500$	1158.4
37	$20(37^2) - 363.2(37) + 2500$	22616

9.  Only Type B increased in growth exponentially. Type A increased at a constant rate.

10.  The slope of a line describes the rate of change and in this case it is how much protein changes with each tablespoon.

11. Step 1: Determine the y-intercept of the function given  $f(x) = -2x - 5 \leftarrow y\text{-int} = -5$ .

Step 2: Determine the y-intercept of the points given by either plotting it or extending the table based on the pattern (common difference).

x	g(x) $\leftarrow$ also known as 'y'
-8	2
-6	3
-4	4
-2	5
0	6 $\leftarrow y\text{-intercept} = 6$

$f(x)$  y-int = -5  
 $g(x)$  y-int = 6

$$6 - (-5) = \boxed{11}$$

12.  $f(x) = 200(2^x)$  is greater than  
 $g(x) = 500x + 400$ ?

X	$200(2^x)$	Y
2	$200(2^2)$	800
4	$200(2^4)$	3200

X	$500x + 400$	Y
2	$500(2) + 400$	1400
4	$500(4) + 400$	2400

- smallest POSITIVE integer, so start w/ 2!

- Answer is 4

13. The y-intercept always represents the INITIAL VALUE, so in this case, it represents the base shipping rate without any textbooks,

14. Subtract movies produced in 2008 from those produced in 2010 + divide by the number of years.

$$\begin{array}{r} 895 \\ - 595 \\ \hline 300 \end{array}$$

$$\frac{300}{5}$$

60 movies per year

15.

Next = Now + 4

- this is an arithmetic sequence because the common difference is 4.