

Wk 9, Unit 9 CA, Quadratic Functions

**Must Show Work to Get Credit**

1 The amount of medication left in the body can be represented by the function below.

$$A(t) = 500 \left(\frac{1}{2}\right)^t \quad A = 500, b = \frac{1}{2}$$

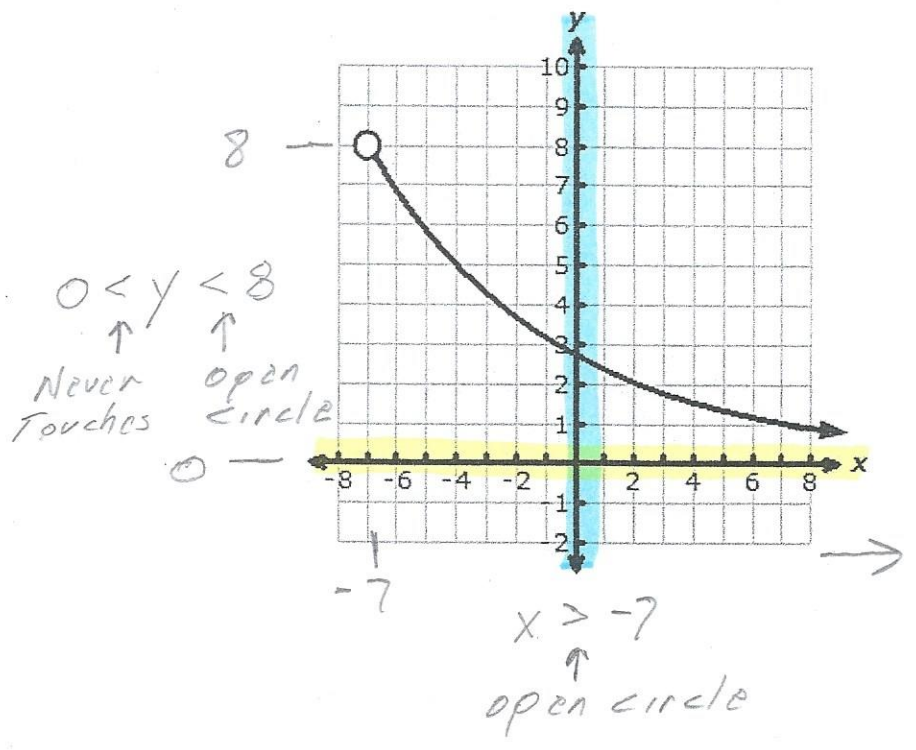
Which statement represents the meaning of the  $a$  and  $b$  values from the function in terms of the problem situation?

- A The  $a$  value of 500 is the amount of medication at time  $t$ , and the  $b$  value of  $\frac{1}{2}$  represents that it decreases every half hour. X
- B The  $a$  value of 500 times the  $b$  value of  $\frac{1}{2}$  is always the amount of medication that will remain in the body. X
- C The  $a$  value of  $\frac{1}{2}$  represents the original amount of medication, and the  $b$  value of 500 represents that for every time interval,  $t$ , the amount of medication increases by 500. X
- D** The  $a$  value of 500 represents the original amount of medication, and the  $b$  value of  $\frac{1}{2}$  represents that for every time interval,  $t$ , the amount of medication decreases by half.

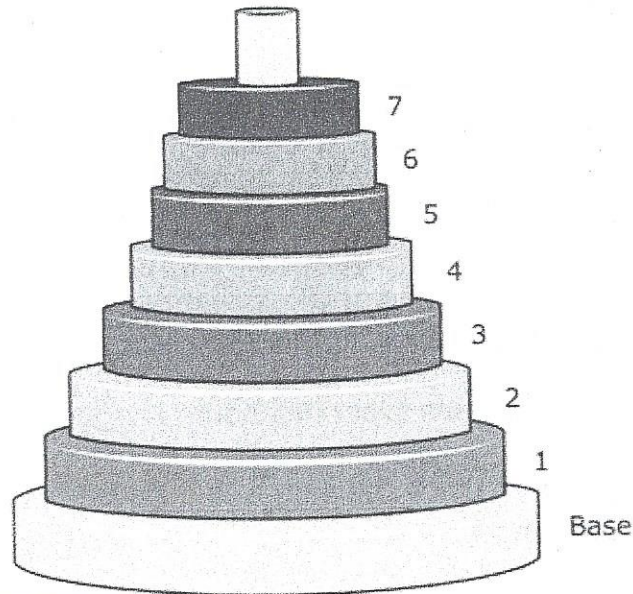
2 The graph of an exponential function is shown below.

What are the domain and range for the exponential function?

- F Domain:  $0 < y < 8$   
Range:  $x > -7$
- G Domain:  $x \geq -7$   
Range:  $0 < y \leq 8$
- H** Domain:  $x > -7$   
Range:  $0 < y < 8$
- J Domain:  $0 < y \leq 8$   
Range:  $x \geq -7$



- F 3 A toy is made up of cylindrical rings stacked on a base, as shown in the diagram. The diameter of Ring 1 is 87% of the diameter of the base. For Ring 2 through Ring 7, the diameter of each ring is 87% of the diameter of the ring directly below it.



The diameter of the base is 5 inches. Which function can be used to find the diameter in inches of Ring  $r$ , where  $1 \leq r \leq 7$ ?

- A  $d(r) = 5(0.87)^r$   
 B  $d(r) = 0.87(r - 5)$   
 C  $d(r) = 0.87(5)^r$   
 D  $d(r) = 5(r - 0.87)$

$A = 5$

$b = \text{rate} = 87\% = .87$

- F 4 The table contains some points on the graph of an exponential function.

$x$	$y$
0	0.0625
1	0.25
2	1
3	4

←  $A$  value

↓  
Rate Increases

Based on the table, which function represents the same relationship?

- F  $q(x) = (0.25)^x$   
 G  $q(x) = 256(0.25)^x$   
 H  $q(x) = 0.0625(4)^x$   
 J  $q(x) = 0.5(4)^x$

$b > 1$



5 Jack and Jill are beginning a lawn care business. They have purchased a zero turn radius riding lawn mower for \$6,500. For tax purposes, its value is expected to depreciate at a rate of 15% annually. Which function represents the value of the riding lawn mower in dollars,  $V(t)$ , as a function of elapsed time in years,  $t$ ?

- A  $V(t) = (0.85)^t$
- B  $V(t) = 15(6500)^t$
- C  $V(t) = 6500(0.85)^t$
- D  $V(t) = 6500(0.15)^t$

*A value*  
Rate = 15% = .15

*Decay*

$b < 1$

$b = 1 - \text{rate}$

$b = 1 - .15$

$b = .85$

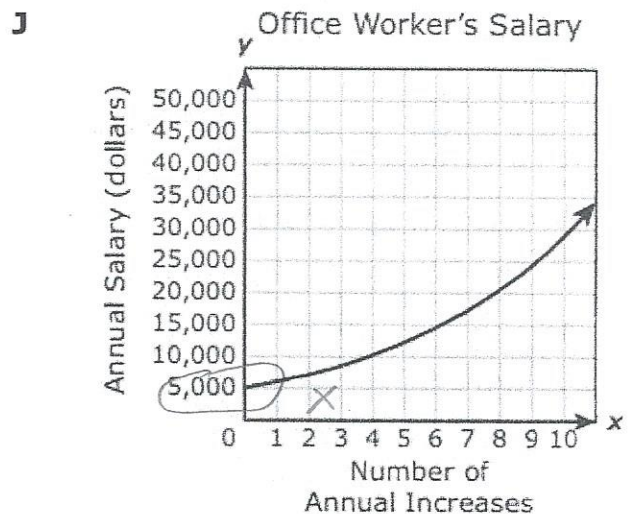
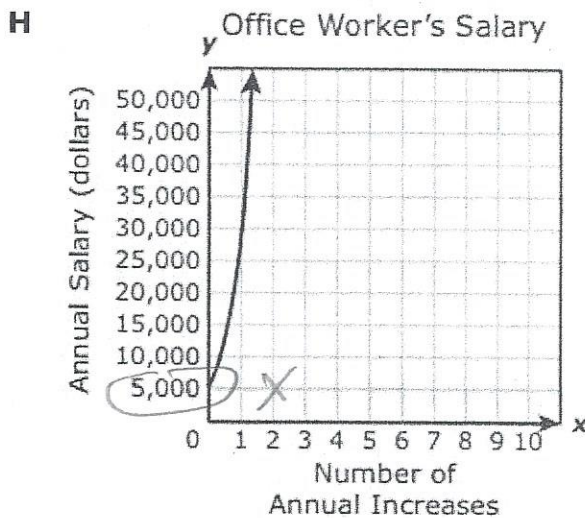
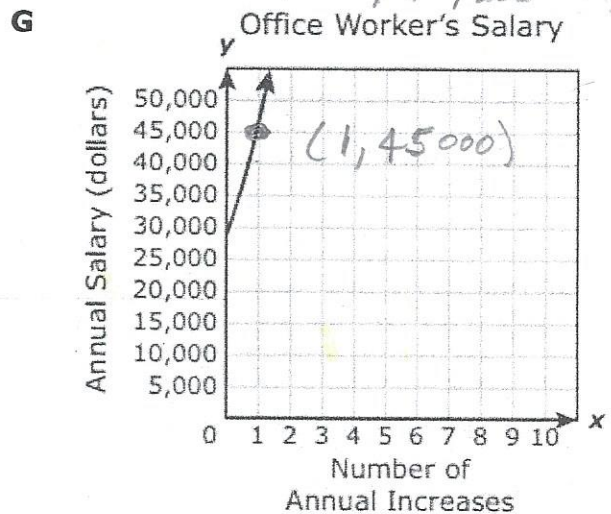
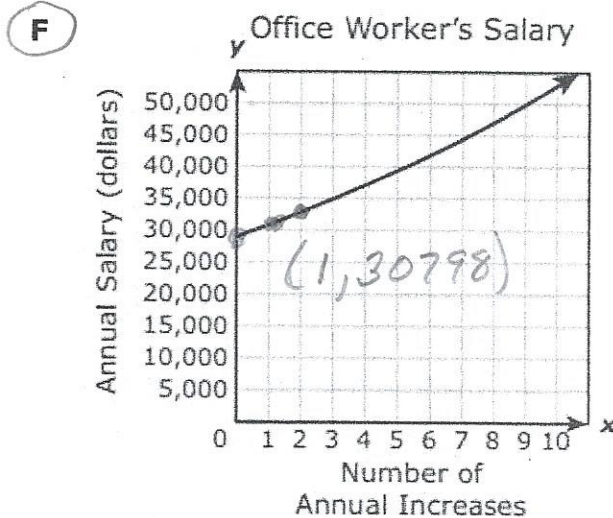
6 The starting annual salary for an office worker at a company is \$29,000. If the company awards an annual increase of 6.2%, which graph models this situation after the office worker receives  $x$  annual increases?

$6.2\% = .062$

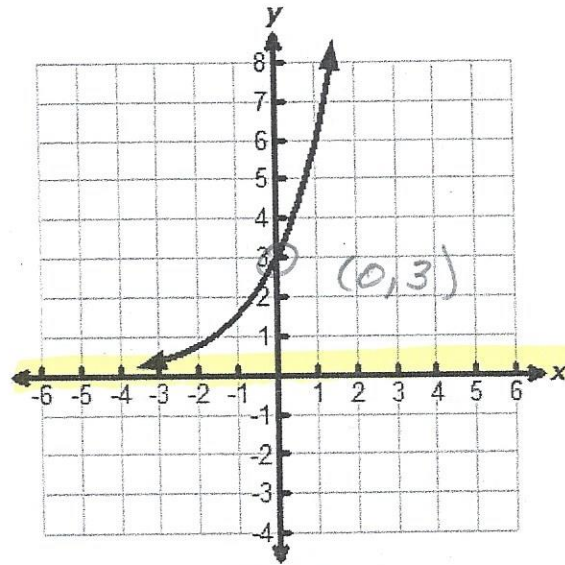
*A value*  
 $y = 29,000(1.062)^x$   
 $1 + \text{rate}$

Graph  
Table

x	y
0	29,000
1	30,798
2	32,708



7 An exponential function is graphed below.



Based on the graph, which statement does NOT appear to be true?

F The graph of the exponential function has a horizontal asymptote at  $y = 0$ . ✓

G The  $y$ -intercept is at the point  $(0, 3)$ . ✓

H The graph of the exponential function has a vertical asymptote at  $x = 2$ . ?

J The graph of the function represents exponential growth. ✓

*A value*

*Rapid Fall*

8 On Monday there were 256 people in the isolation ward with the flu. On Tuesday there were 192 people in the isolation ward with the flu. On Wednesday there were 144 people in the isolation ward with the flu. Which function and description best represents the problem situation?

A  $p(t) = 0.75(256)^t$

The function represents exponential growth because common ratio,  $b$ , is 256 and is in the interval  $b > 1$ .

*Rate Decreasing,  $b < 1$   
X by .75 each day*

B  $p(t) = 256(0.75)^t$  ✓

The function represents exponential decay because common ratio,  $b$ , is 0.75 and is in the interval  $0 < b < 1$ . ✓

C  $p(t) = 0.75t + 256$  X

The function represents linear growth because common difference,  $d$ , is 0.75.

D  $p(t) = 256t^{0.75}$  X

The function represents exponential decay because the exponent is 0.75 and is in the interval  $0 < b < 1$ .