3. Leaping Liang just signed a contract with a women's basketball team. The contract guarantees her $20,000 the first year, $40,000 the second year, $80,000 the third year, $160,000 the fourth year, and so on, for 10 years.

a. Make a table showing Liang's salary for each year of this contract.

Year Number	Salary
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total:

b. What is the total amount Liang will earn over the 10 years?

c. Does the relationship between the number of years and salary represent an exponential function? Explain.

d. Write an equation for Liang's salary s for any year n of her contract.

4. As a biology project, Talisha is studying the growth of a beetle population. She starts her experiment with 5 beetles. The next month she counts 15 beetles.

| Zero Months | One Month | Two Months |
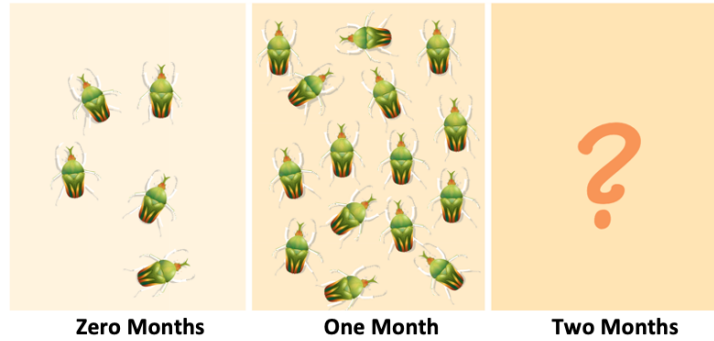
a. Suppose the beetle population is growing **linearly**. How many beetles can Talisha expect to find after 2, 3, and 4 months?

# of Month	# of Beetles
0	
1	
2	
3	
4	

b. Suppose the beetle population is growing **exponentially**. How many beetles can Talisha expect to find after 2, 3, and 4 months?

# of Month	# of Beetles
0	
1	
2	
3	
4	

c. Write an equation for the number of beetles b after m months if the beetle population is growing linearly. Explain what information the variables and numbers represent.

d. Write an equation for the number of beetles b after m months if the beetle population is growing exponentially. Explain what the variables and numbers represent.

e. How long will it take the beetle population to reach 200 if it is growing linearly?

f. How long will it take the beetle population to reach 200 if it is growing exponentially?

6. A population of mice has a growth factor of 3. After 1 month, there are 36 mice. After 2 months, there are 108 mice.

a. How many mice were in the population initially (at 0 months)?

Month Number	Number of Mice
0	
1	
2	

b. Write an equation for the population after any number of months. Explain what the numbers and variables in your equation mean.
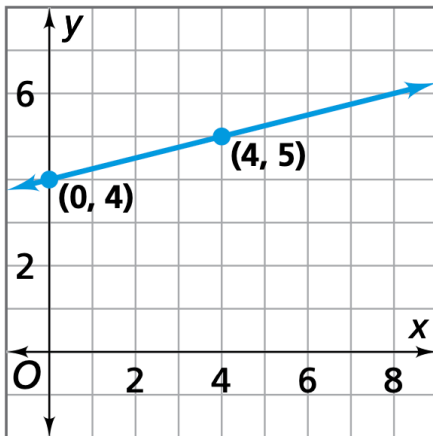
7. Fido did not have fleas when his owners took him to the kennel. The number of fleas on Fido after he returned from the kennel grew according to the equation $f = 8(3^n)$, where f is the number of fleas and n is the number of weeks since he returned from the kennel. (Fido left the kennel at week 0.)
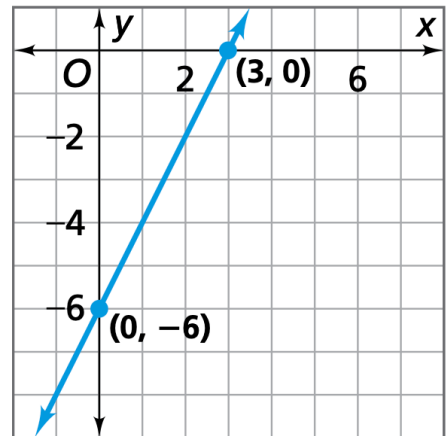
$$f = 8(3^n)$$

a. How many fleas did Fido pick up at the kennel?

b. Is the relationship represented by the equation an exponential function? If so, what is the growth factor for the number of fleas?

c. How many fleas will Fido have after 10 weeks if they are untreated?

For Exercises 25–28, write an equation for each line. Identify the slope and y-intercept.
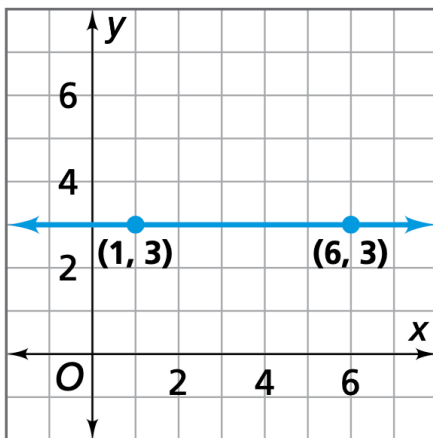
25.

Points labeled: $(4, 5)$, $(0, 4)$

26.

Points labeled: $(3, 0)$, $(0, -6)$

27.

Points labeled: $(1, 3)$, $(6, 3)$

28.

Points labeled: $(-2, 3)$, $(2, -9)$