Identify whether the following tables represent a linear or exponential relationship:

1.

x	y
1	-6
2	-12
3	-24
4	-48
5	-96

2.

x	y
1	4
3	1
4	.5
5	.25
6	.125

3.

x	y
1	13
2	25
3	37
4	49
5	61

4.

x	y
4	10
6	15
8	20
9	23
10	25

5.

x	y
0	3
1	12
2	48
3	192
4	768

6.

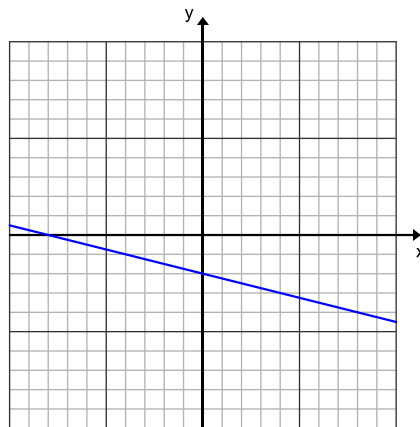| x	y
2	-63
3	-189
4	-567
5	-1701
6	-5103

Identify whether the following graphs represent a linear or exponential relationship:
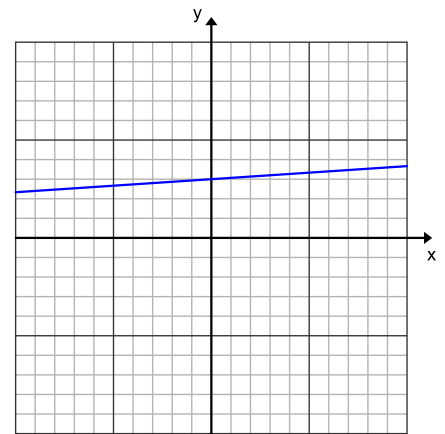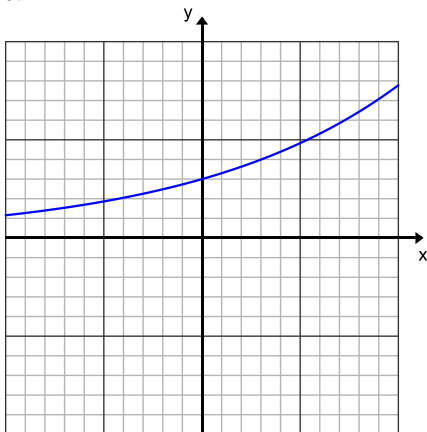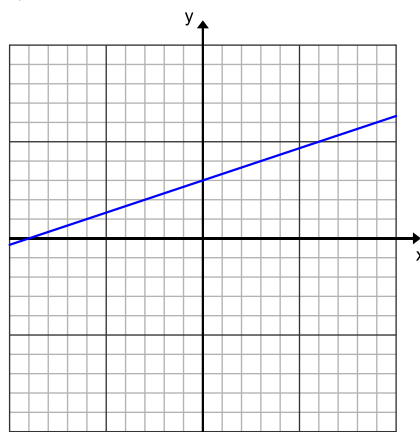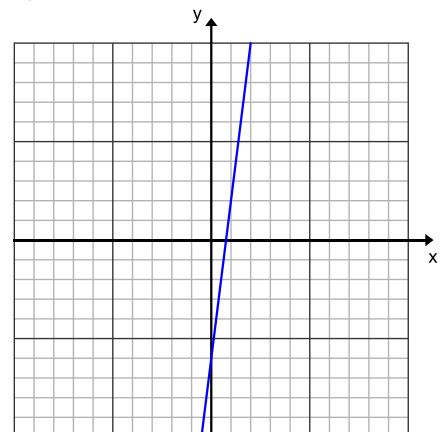
7.
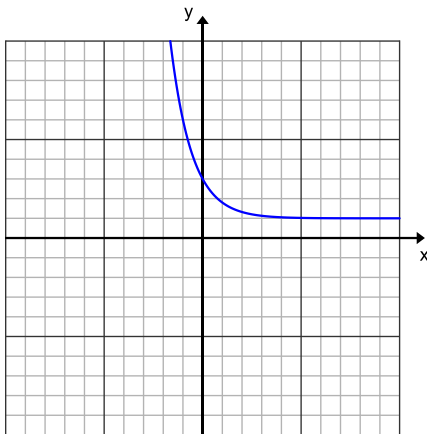
8.

9.

10.

11.

12.

13. You have a lawn with 5 dandelions on it. You hear that the number of dandelions can quadruple every week.

   a. How many will you have in 3 weeks? In 6 weeks?

   b. Write a rule that would calculate how many dandelions the lawn will have after any number of weeks. Write your equation in two equivalent ways.

14. Which of the following expressions would show a rabbit population starting with 5 rabbits, doubling three times?

   A. $3^5 \cdot 2$
      B. $2^5 \cdot 3$
      C. $2^3 \cdot 5$
      D. $3^2 \cdot 5$

15. A game allows you to triple your score every time you score a bull's-eye. Your current score is 37. If you only scored with bull's-eyes, which of the following equations would calculate your score in relation to how many bull's-eyes you hit? Let S stand for your score, and b stand for the number of bull's-eyes you hit.

   A. $S = 37 + 3b$
   B. $S = 3 + 37b$
   C. $S = 37(3)^b$
   D. $S = 3(37)^b$

16. Mark currently has 19 points in a basketball games. His coach sees he is on fire and tells him don't take a shot unless it is a three pointer. Assuming he only makes 3 pointers the rest of the game, which of the following equations would calculate how many points Mark finishes with? Let S represent his score, and t the number of three pointers.

   A. $S = 3(19^t)$
   B. $S = 3t + 19$
   C. $S = 3 + 19t$
   D. $S = 19(3)^t$

17. A new town is growing rapidly. It triples every 4 years. How large will it be in 200 years if it currently has 800 people in it?

18. A certain state park tracks the population growth of deer in their park. They find that the population tends to double every 15 years. Write an **expression** to calculate how many deer there will be in the park in 120 years if the trend continued and the park currently has 50 deer. Write your expression in two equivalent ways. **Do not calculate the number of deer**.

19. A certain strain of virus increases in number by 5 times every day. If it starts with one virus, write an expression that would calculate how many viruses there would be in 30 days. Write your expression in two equivalent ways. **Do not solve.**

20. Determine whether each scenario can be modeled by a linear or an exponential equation.

   a. The price of a loaf of bread increases by $0.25 each week.

   b. Each week, a loaf of bread costs twice as much as it did the week before.

   c. The attendance at a football game reduces by one fourth every minute during the third quarter.

   d. 10 people leave a football game every minute after the third quarter.

21. A population of insects doubles every month. There were 100 insects to start with, Write an equation, and calculate how many there will be after 7 months? Write your equation in two equivalent ways.

22. A population of bacteria doubles every hour. They are 18,432 after 10 hours. How many were there to start with?

23. Someone is able to double their money every 10 years. They start by investing $20. Write an equation that would determine how long it would take them get to get to $1,000,000. Let t stand for the number of years that have passed. Write your equation in two equivalent ways. **Do not solve.**

Match equivalent equations	
24. $3x + 4 = y$	**A.** $-3x + 4 = y$
	B. $-3x - 4 = y$
25. $3(4)^x = y$	
	C. $y - 4 = 3x$
26. $4 - 3x = y$	**D.** $3(4^x) + 3 = y$
	E. $4^x \cdot 3 = y$
27. $3 + 4^x \cdot 3 = y$	
	F. $(3 \cdot 4)^x = y$