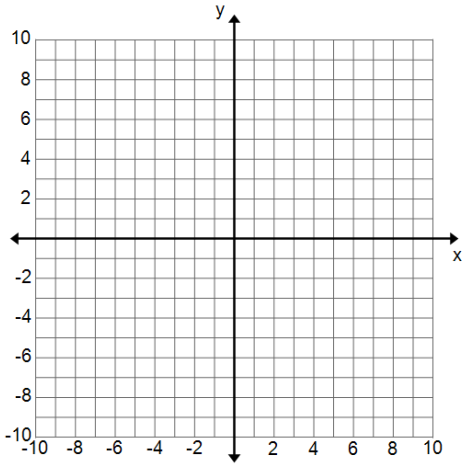
Name_____ Period_____ Date_____

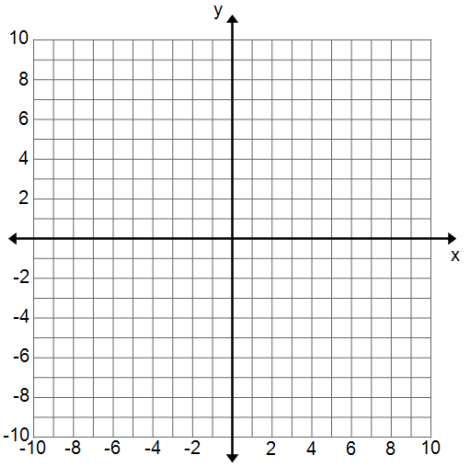
Sec 1 H **Practice Test 3** **Unit 3**

Make a table and graph each of the following equations.

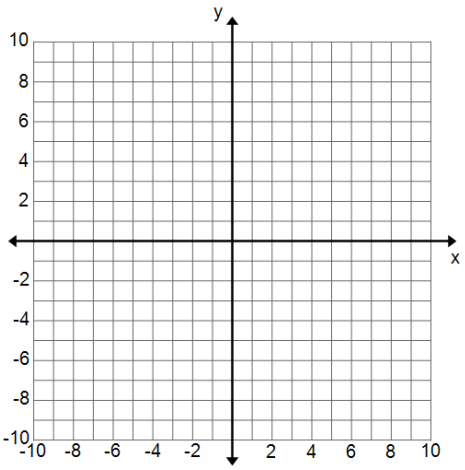
1. $y = 9\left(\frac{1}{3}\right)^x$



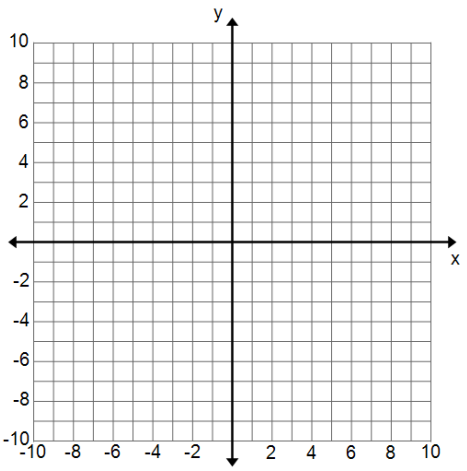
2. $y = -3 \bullet 2^x$



3. $y = 4(2)^x + 3$



4. $y = \frac{1}{2}(2)^x - 3$



5. You take a job and are promised, if you work well, you will receive a 5% raise each year. You start out making $20,000 this year.

a. Write an equation that will help calculate how much money you will make in *n* years (assuming you work very well.)

b. How much will you make in your fifth year?

6. You take a job disposing of hazardous materials. You are able to reduce the waste by 85% each year. You start with 50,000 tons of material.

a. Write an equation that will help you calculate how much waste will remain in *t* years.

b. How many pounds of material will remain in 3 years?

7. You deposit $1600 in a bank account. Find the balance after 3 years for each of the following situations.

a. The account pays 2.5% annual interest compounded monthly.

b. The account pays 0.18% annual interest compounded quarterly.

c. The account pays 4% annual interest compounded semi-annually.

8. Which equation represents the fastest exponential growth?

A. $1.05(.98)^x$ **B**. $0.98(1.05)^x$

C. $1.06(.97)^x$ **D**. $0.97(1.06)^x$

9. Which equation represents the fastest exponential decay?

A. $1.05(.98)^x$ **B**. $0.98(1.05)^x$

C. $1.06(.97)^x$ **D**. $0.97(1.06)^x$

10. If you deposit $3,000 in an account that pays 1.2% interest compounded monthly which expression will calculate the value in the savings account in 3 years?

A. $3,000(1+.012)^3$ **B**. $3,000\left(1+\frac{.012}{12}\right)^3$

C. $3,000\left(1+\frac{.012}{12}\right)^{36}$ **D**. $3,000(1+.012)^{36}$

11. The value of a new motorcycle purchased for $12,000 decreases 6% per year. Which exponential decay model will calculate the value of the car in any number of years?

A. $12,000(.94)^t$ **B**. $12,000(1.06)^t$

C. $12,000(.4)^t$ **D**. $12,000(1.6)^t$

12. You plant a sunflower when it is 2 inches tall. It grows 3 inches per week. Which expression will calculate how tall it will be in 16 weeks?

A. $2+16 \cdot 3$ **B**. $16+2 \cdot 3$

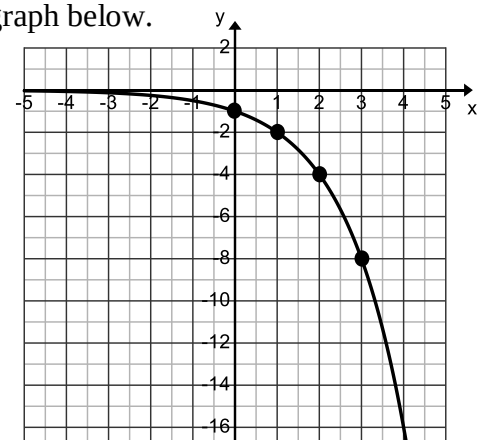
C. $16 \cdot 2^3$ **D**. $16 \cdot 3^2$

13. Write the explicit equation that represents the pattern in the table below.

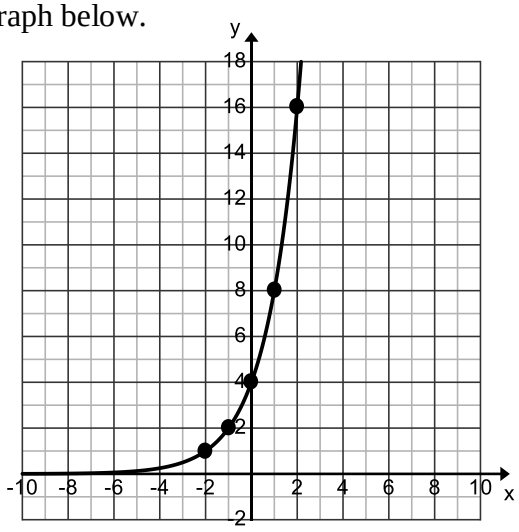
x	y
1	65
2	44
3	23
4	2

14. Mary's car displays the number of gallons remaining in her gas tank. When she fills her tank, she has 18.7 gallons of gas. After travelling 2, 3, and 4 miles, she has 17.3, 16.6, and 15.9 gallons of gas left, respectively. Write an explicit equation that represents the remaining gallons of gas after traveling x miles.

15. Write the explicit equation that represents the relationship between x and y shown in the graph below.



16. Write the explicit equation that represents the relationship between x and y shown in the graph below.



17. A population of deer is decreasing. The population this year is 800 deer. After 1 year, it is estimated that the population will be 720 deer. After 2 years, it is estimated that the population will be 648 deer. Write an equation to describe the deer population in any year x?

18. Write an equation that represents the pattern in the table below.

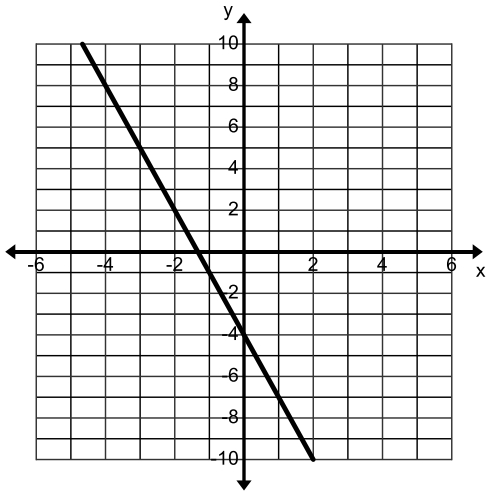
x	y
0	**4**
1	**48**
2	**576**
3	**6912**

19. The population of a small town is 3,200 people. Based on growth of the population in past years, it is estimated that after 1, 2, and 3 years, the population will be 4000, 5000, and 6250 people, respectively. Which function describes the relationship between year and town population?

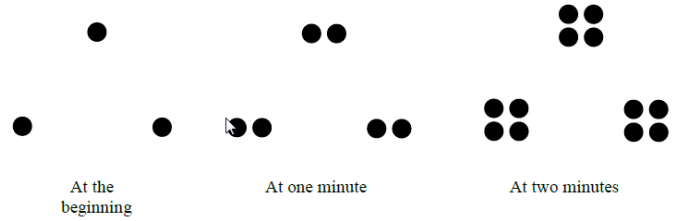
20. Write an equation that represents the relationship between *x* and *y* shown in the table below?

x	y
0	**7**
1	**112**
2	**1792**
3	**28672**

21. Write the equation that represents the relationship between *x* and *y* shown in the graph below.



22. Write an equation to describe how many dots there are after *x* minutes.



23. A certain type of tree triples its weight every 5 years for the first twenty years. It it weighs 10 pounds when it is planted, how much would it weigh at the end of the first 20 years?

24. Your grass is 3 inches long right now. It grows about 1.5 inches per day. Write an equation to correctly calculate how long it will be in *d* days.

25. A new business hopes to double its enrollments each decade for the next 3 decades. It is starting with 22,000 enrollments. Which expression would calculate how many people will be enrolled in 3 decades?

A. $22,000(3)^2$ **B.** $22,000(2)^3$

C. $22,000+(3)^2$ **D.** $22,000(2)^3$

26. Bacteria can multiply at an alarming rate by tripling every day. We start with 2 bacteria.

a) Write an equation to represent the growth of the bacteria.

b) How many bacteria will there be after 8 days?

27. Another population of bacteria doubles every hour and started with 13.

a) Write an equation to represent the growth of the bacteria.

b) How many bacteria will there be after 6 hours?

28. You have a lawn with 5 dandelions on it. You hear that the number of dandelions can increase by 10 per week. How many dandelions will there be after 7 weeks?

29. You have an orchard with 24 trees in it. The trees triple every 5 years. How many trees will there be after 30 years?

30. Sharon is given $40 for her birthday and puts it in her savings account. She starts adding $10 each month to the account. Write an equation that represents how much money she has.

31. A fire doubles its square footage every hour. Right now it is 7 acres. Write an equation to calculate how large it will be in *h* hours.

32. Which equation shows exponential growth?

A. $y=0.5(0.9)^x$ **C.** $y=2(1.98)^x$

B. $y=11.8(0.92)^x$ **D.** $y=1.8(0.21)^x$

33. Which equation correctly shows an initial value of 4 and declining at a rate of 12%?

A. $y=4(1+0.12)^x$ **C.** $y=12(1+0.04)^x$

B. $y=4(1-0.12)^x$ **D.** $y=4(1-12)^x$

34. Given the equation $y=17(1.08)^x$ which of the following is true:

A. The initial value is 17 and it is increasing at a rate of 8%.

B. The initial value is 1.08 and it is increasing at a rate of 17%.

C. The initial value is 17 and it is decreasing at a rate of 8%.

D. The initial value is 17 and it is increasing at a rate of 1.08%.