**Math 1** **Name:** _____

## Unit 4.5 Exponential functions PRACTICE

**Period:** _____

**Determine whether each table or rule represents a linear or an exponential function. Explain.**

1. $f(x) = 3^x$

2. $f(a) = 5 \cdot 0.9^a$

3. $y = 5 \cdot 2^x$

4. $y = 6 \cdot x^3$

5. $y = 3x - 8$

6. $y = 4 \cdot 0.3^x$

**Evaluate each function for the given value.**

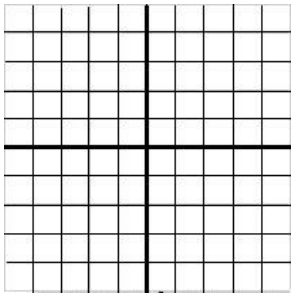
7. $f(x) = 5^x \quad for\ when\ x = 4$

8. $h(t) = 3 \cdot 4^t \quad for\ when\ t = -3$

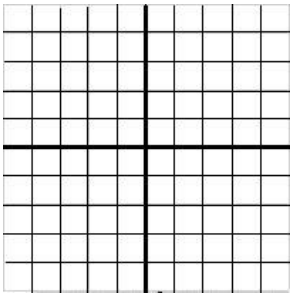
9. $y = 8 \cdot 0.7^x \quad for\ when\ x = 3$

**Graph each exponential function.**

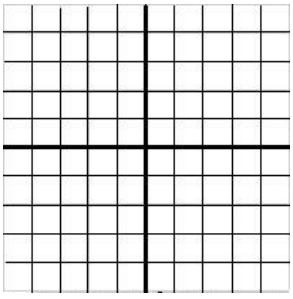
10. $f(x) = 3^x$



11. $y = 3 \cdot 0.25^x$



12. $y = 8 \cdot 1.2^x$



13. An investment of $8000 in a certain Certificate of Deposit (CD) doubles in value every seven years. The function that models the growth of this investment if $f(x) = 8000 \cdot 2^x$, where x is the number of doubling periods. If the investor does not withdraw any money from this CD, how much money will be available for withdrawal after 28 years?

14. A population of amoebas in a petri dish will triple in size every 20 minutes. At the start of an experiment the population is 800. The function $y = 800 \cdot 3^x$, where x is the number of 20 minute periods, models the population growth. How many amoebas are in the petri dish after 3 hours?

15. A new car cost $15,000 to build in 2010. The company's financial analysts expect costs to rise by 6% per year for the 10 years they are planning to build the car. The cost to build the car can be modeled by the function $f(t) = 15{,}000(1.06)^t$, where t is the number of years after 2010. How much will it cost the company to build the car in 2017?

**Evaluate each function over the domain $\{-2, -1, 0, 1, 2, 3\}$.**
**As the values of the domain increase, do the values of the range increase or decrease?**

16. $f(x) = 3^x$ $f(-2) =$ $f(-1) =$ $f(0) =$

$f(1) =$ $f(2) =$ $f(3) =$

Range increases or decreases? (Circle one)

17. $f(x) = 4.2^x$ $f(-2) =$ $f(-1) =$ $f(0) =$

$f(1) =$ $f(2) =$ $f(3) =$

Range increases or decreases? (Circle one)

18. $f(x) = 0.3^x$ $f(-2) =$ $f(-1) =$ $f(0) =$

$f(1) =$ $f(2) =$ $f(3) =$

Range increases or decreases? (Circle one)

19. $f(x) = 4 \cdot 3^x$ $f(-2) =$ $f(-1) =$ $f(0) =$

$f(1) =$ $f(2) =$ $f(3) =$

Range increases or decreases? (Circle one)

20. $f(x) = 50 \cdot 0.1^x$ $f(-2) =$ $f(-1) =$ $f(0) =$

$f(1) =$ $f(2) =$ $f(3) =$

Range increases or decreases? (Circle one)

**Solve each equation.**

21. $3^x = 81$

22. $5 \cdot 2^x = 40$

23. $4^x + 4 = 68$

24. $3 \cdot 2^x - 16 = 80$

25. $\frac{1}{3} \cdot 5^x + 1 = \frac{76}{75}$

26. $1 - 3(7^x - 2) = 4$