Math 1 **Name:** KEY

Unit 4.6 Exponential Growth and Decay PRACTICE

Period: _____

Identify the initial amount a and the growth factor b in each exponential function.

1. $f(x) = 3 \cdot 5^x$ $a = 3$, $b = 5$

2. $y = 250 \cdot 1.065^x$ $a = 250$, $b = 1.065$

3. $g(t) = 3.5^t$ $a = 1$, $b = 3.5$

4. $h(x) = 5 \cdot 1.02^x$ $a = 5$, $b = 1.02$

Find the balance in each account after the given period.

5. $8000 principal earning 5% compounded annually, after 6 years $10,720.77

6. $2000 principal earning 5.4% compounded annually, after 4 years $2468.27

7. $500 principal earning 4% compounded quarterly, after 10 years $744.43

8. $6500 principal earning 2.8% compounded monthly, after 2 years $6873.94

Identify the initial amount a and the decay factor b in each exponential function.

9. $y = 8 \cdot 0.8^x$ $a = 8$, $b = 0.8$

10. $f(x) = 12 \cdot 0.1^x$ $a = 12$, $b = 0.1$

State whether the equation represents exponential growth, exponential decay, or neither.

11. $y = 0.82 \cdot 3^x$ **exponential growth**

12. $f(x) = 5 \cdot 0.3^x$ **exponential decay**

13. $f(x) = 18 \cdot x^2$ **neither**

14. $y = 0.9^x$ **exponential decay**

15. The town manager reports that revenue for a given year is $2.5 million. The budget director predicts that revenue will increase by 4% per year, bi-annually. If the director's prediction holds true, how much revenue will the town have available 10 years from the date of the town manager's report? Write an expression to represent the equivalent monthly increase in revenue.

Principle = P = 2,500,000

Annual interest rate as a decimal = r = 0.04

Number of times interested per year = n = 2

Number of years invested = t = 10

Expression = $A = 2500000\left(1 + \frac{0.04}{2}\right)^{2 \cdot 10}$

Revenue to the town available after 10 years = $3,714,868.49

16. A wildlife manager determines that there are approximately 200 deer in a certain state park.

a. The population is growing at a rate of 7% per year. How many deer will live in the park after 4 years?

Principle = P = 200

Annual interest rate as a decimal = r = 0.07

Number of times interested per year = n = 1

Number of years invested = t = 4

Expression = $A = 200\left(1 + \frac{0.07}{1}\right)^{1 \cdot 4}$

Number of deer living in the park after 4 years = about 262 deer

b. If the carrying capacity of this park is 350 deer, how long will it take for the deer population to reach carrying capacity?

Between 8 years and 9 years.

17. A business purchases a computer system for $3000. If the value of the system decreases at a rate of 15% per month, how much is the computer worth after 4 years?

Principle = P = 3000

Annual interest rate as a decimal = r = -0.15

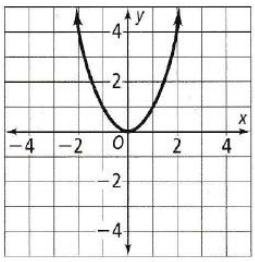
Number of times interested per year = n = 12

Number of years invested = t = 4

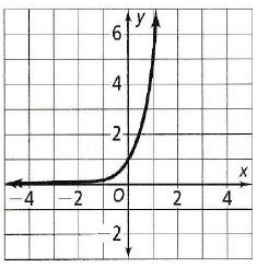
Expression = $A = 3000\left(1 + \frac{-0.15}{12}\right)^{12 \cdot 4}$

Computer worth after 4 years = $1640.22

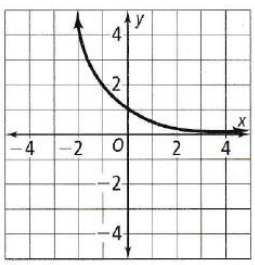
State whether each graph shows an exponential growth function, an exponential decay function, or neither.

18. 

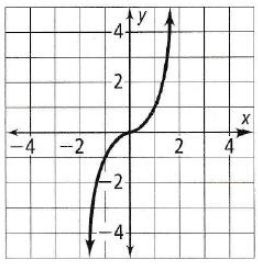
neither

19. 

exponential growth

20. 

exponential decay

21. 

neither