

Name: _____

HW: Exponential & Linear

Determine whether the following scenarios would be best modeled using a linear or exponential model. Then, write an equation.

1.

- Ms. Hunter takes off 10 points for each day an assignment is turned in late. The assignments are worth 100 points each.
- There are 200 ladybugs in a certain population. The population is decreasing by 14% per day.
- Your salary starts at \$23000 and goes up by 5% per year.
- A painter is going to charge \$90 for paint and \$35 an hour to paint your kitchen.

2. Given the situations below, identify if it is a linear or exponential model or neither. Explain your reasoning.

- a. A savings account that starts with \$5000 and receives a deposit of \$825 per month.
- b. The value of a house that starts at \$150,000 and increases by 1.5% per year.
- c. Tina owns 4 rabbits. She expects them to double each year.
- d. The cost of operating Jelly's Doughnuts is \$1600 per week plus \$.10 to make each doughnut.
- e. The value of John's car that depreciates 20% per year
- f. The height of a ball that is thrown in the air

3. Which situation could be modeled with an exponential function?

- (1) the amount of money in Suzy's piggy bank which she adds \$10 to each week
- (2) the amount of money in a certificate of deposit that gets 4% interest each year
- (3) the amount of money in a savings account where \$150 is deducted every month
- (4) the amount of money in Jaclyn's wallet which increases and decreases by a different amount each week

Part II – Exponential Growth & Decay Applications

4. The rent for an apartment was \$6,600 per year in 2012. If the rent increased at a rate of 4% each year thereafter, use an exponential equation to find the rent of the apartment in 2017.

4. _____

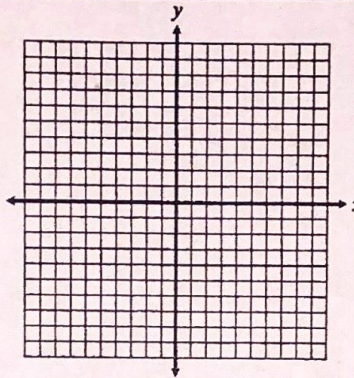
5. _____

5. The population of a town was 14,000 in 2010. If the population decreased at a rate of 1.5% each year thereafter, use an exponential function to find the population after 10 years.

Graph each exponential function using a table, then identify its key characteristics.

6. $f(x) = 4^x - 7$

a:
b:
h:
k:



stretch/shrink/neither
Growth / Decay

Domain: _____

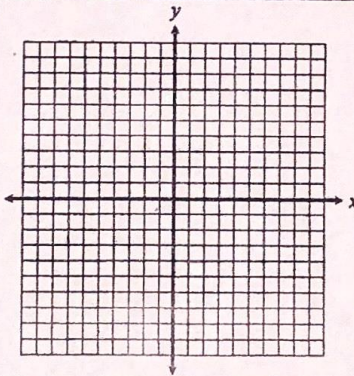
Range: _____

y-intercept: _____

Asymptote: _____

7. $f(x) = 6 \cdot \left(\frac{1}{3}\right)^x + 2$

a:
b:
h:
k:



stretch/shrink/neither
Growth / Decay

Domain: _____

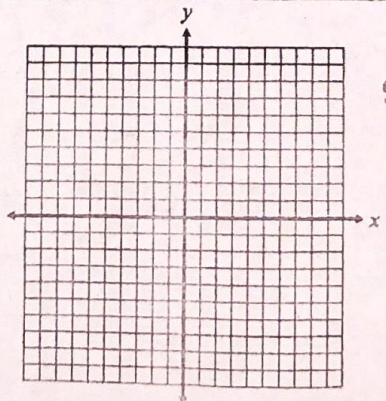
Range: _____

y-intercept: _____

Asymptote: _____

8. $y = 3^x - 4$

a:
b:
h:
k:



stretch/shrink/neither
Growth / Decay

Domain: _____

Range: _____

y-intercept: _____

Asymptote: _____

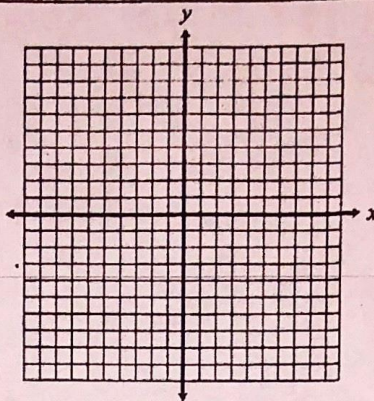
9. $y = \frac{1}{2} \cdot \left(\frac{1}{4}\right)^x$

a:

b:

h:

k:



stretch/shrink/neither
Growth / Decay

Domain: _____

Range: _____

y-intercept: _____

Asymptote: _____

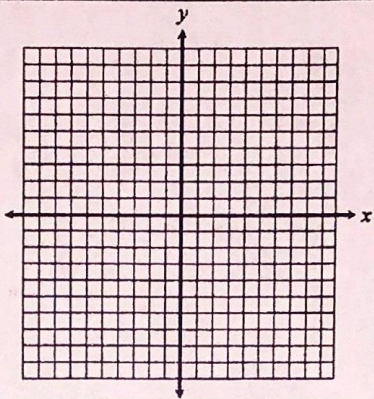
10. $y = \frac{3}{2} \cdot 2^x + 1$

a:

b:

h:

k:



stretch/shrink/neither
Growth / Decay

Domain: _____

Range: _____

y-intercept: _____

Asymptote: _____

Topic 6: Exponential Growth & Decay Applications

EXPONENTIAL GROWTH FUNCTION

11. $y =$

EXPONENTIAL DECAY FUNCTION:

12. $y =$

13. A population of a city is 422,000 and increases by 12% each year. Use an exponential function to find the population of the city after 8 years.

14. A car bought for \$13,000 depreciates at 15% per year. Use an exponential function to find the value of the car after 5 years.

15. Scott purchased a painting in 2006 for \$1,250. Since then, its value has increased by 6% each year. Use an exponential function find the value of the painting in 2017.