Name: _____ Period: _____

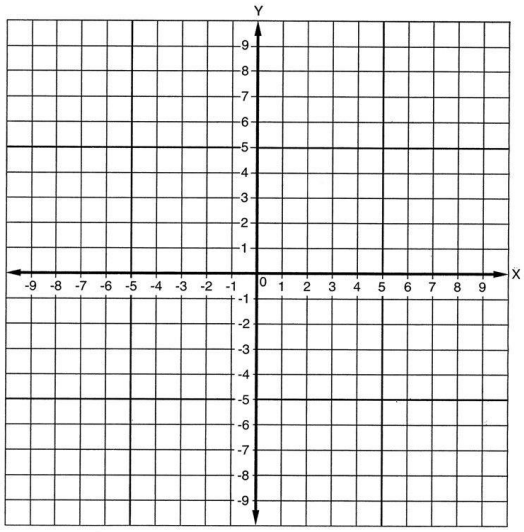
Exponential vs. Linear Functions Notes

Part I – Graphing Exponential Functions

Directions: Graph each exponential function by creating a table and identifying its key characteristics.

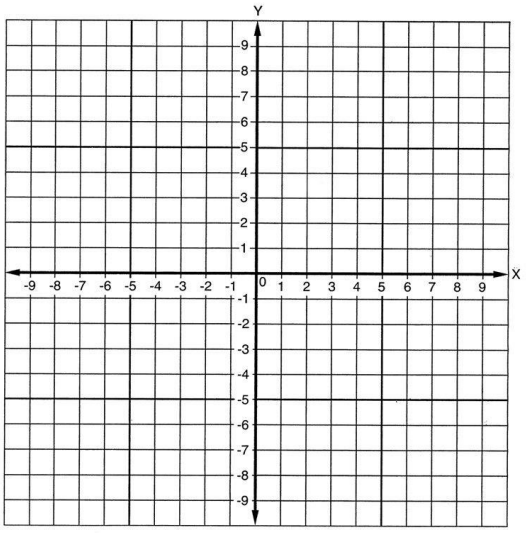
1. $y = \left(\frac{1}{3}\right)^x$ stretch/shrink/neither
   growth/decay
   a: _____ domain: _____
   b: _____ range: _____
   h: _____ y-intercept: _____
   k: _____ Asymptote: _____

x	y



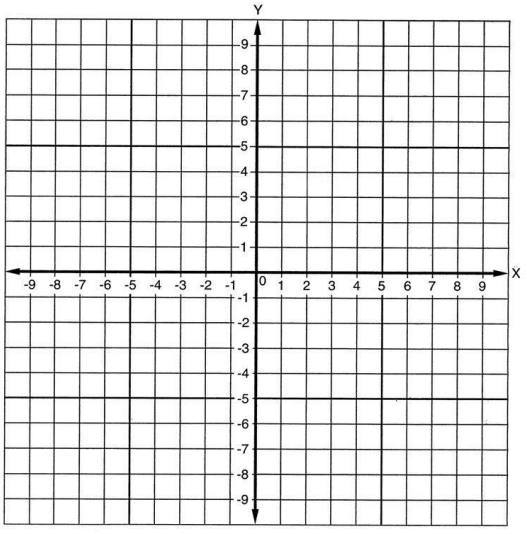
2. $y = 2^x + 6$ stretch/shrink/neither
   growth/decay
   a: _____ domain: _____
   b: _____ range: _____
   h: _____ y-intercept: _____
   k: _____ Asymptote: _____

x	y



3. $y = 8 \cdot \left(\frac{1}{4}\right)^x - 1$ stretch/shrink/neither
   growth/decay
   a: _____ domain: _____
   b: _____ range: _____
   h: _____ y-intercept: _____
   k: _____ Asymptote: _____

x	y



Review of Exponential Growth/Decay Word Problems:

4. The Mendez family just bought a home for $180,000. If the value of the home increases at a rate of 3% per year, use an exponential function to find the approximate value of the home after 10 years. A. $258,000 B. $250,000 C. $242,000 D. $234,000	5. Doug purchased land for $8,000 in 1995. The value of the land depreciated by 4% each year thereafter. Use an exponential function to find the approximate value of the land in 2002. A. $5,760 B. $5,771 C. $6,012 D. $6,262

Part II – Linear vs. Exponential Functions

Exponential Functions: $y = a \cdot b^{x-h} + k$ **or** $f(x) = a \cdot b^{x-h} + k$

- Shows growth/decay at consecutive intervals
- Looks like a normal or backwards "L" or "r" graphically
- **Key words:** increasing, decreasing, lost, depreciate

Linear Functions: $y = mx + b$

- Shows a constant rate of change
- Looks like a straight line graphically
- **Key words:** each

6. Decide whether the word problem represents a linear or exponential function. Circle either linear or exponential. Then write the function formula.

a) A library has 8000 books and is adding 500 more books each year.

linear or exponential *y* = _____

b) A gym's customers must pay $50 for a membership, plus $3 for each time they use the gym.

linear or exponential *y* = _____

c) A bank account starts with $10. Every month, the amount of money in the account is tripled.

linear or exponential *y* = _____

d) At the start of a carnival, you have 50 ride tickets. Each time you ride the roller coaster, you have to pay 6 tickets.

linear or exponential *y* = _____

e) There are 20,000 owls in the wild. Every decade, the number of owls is halved.

linear or exponential *y* = _____