

Determining Rate of Growth or Decay

Name _____ **ANSWERS**

I. *Directions:* In each situation, state whether the equation is exponential growth or decay, and state the percent rate of change. Round to *nearest hundredths* if needed.

Equation	Growth or Decay	% Rate of Change
1. $y = (0.80)^x$	Decay	20% decrease
2. $y = (1.5)^x$	Growth	50% increase
3. $y = 4(0.85)^x$	Decay	15% decrease
4. $y = 0.3(1.25)^x$	Growth	25% increase
5. $y = (1.2)^{4x}$	Growth	107.36% increase
6. $y = (1.2)^{x/10}$	Growth	1.84% increase

$$y = [(1.2)^4]^x \approx [2.0736]^x$$

$$y = (1.2)^{x/10} \approx (1.018399376)^x$$

Explain how to decide whether the equation is exponential growth or decay.

Exponential form: $y = ab^x$.

If $a > 0$ and $b > 1$, exponential growth.
If $a > 0$ and $0 < b < 1$, exponential decay.

Be sure that the equation is in the form $y = ab^x$ before reading the percent rate of change.

$y = a(1+r)^x \rightarrow r$ gives rate of growth

$y = a(1-r)^x \rightarrow r$ gives rate of decay

II. *Directions:* Match the exponential equation with its graph.

1. $y = (0.80)^x$	B
2. $y = (1.5)^x$	E
3. $y = 4(0.85)^x$	C
4. $y = 0.3(1.25)^x$	F
5. $y = (1.2)^{4x}$	D
6. $y = (1.2)^{x/10}$	A

