

Name: _____

Date: _____

Exponential Model: $y = a(b)^x$

a = start value

b = what you multiply or divide by (rate of change)

$b > 1$ (Growth)

$b < 1$ (Decay)

1. Your brother tells you a secret. You see no harm in telling two friends. After this second "passing" of the secret, 4 people now know the secret (your brother, you and two friends). If each of these friends now tells two new people, after the third "passing" of the secret, eight people will know. Write an equation to express the "passing" of the secret. If this pattern of spreading the secret continues, how many people will know the secret after 10 such "passings"?

$a = 1$

$b = 2$

x = # of passings
 y = # of ppl who know

x	1	2	3
y	2	4	8

$y = 1(2)^x$

$y = 1(2)^{10}$

$y = 1024$ people

2. Alexis was working in the biology lab on her cell project. She started her experiment with 500,000 cells. Every day, the cells die by a third. Write an equation to represent how many cells would be left after each day. How many days will Alexis have until there are less than 100 cells left?

$a = 500,000$

$b = (1/3)$

x = # of days

y = # of cells

$y = 500,000 (1/3)^x$

8 days

3. The following table represents how the amount of caffeine in your system each hour after drinking a grande coffee.

x	$c(x)$
0	330
1	165
2	82.5
3	41.25
4	20.625

Rate of change

$\frac{y_2}{y_1}$

- a. Write an equation based on the information:

$y = 330 (1/2)^x$

- b. How many hours would it take to have less than 1mg of caffeine left in your system?

9 hours

$\div 2 = * 1/2$

$\div 3 = * 1/3$

$\div 4 = * 1/4$

4. Sally has a leaking faucet in her bathroom. When she first noticed the leak, there was a puddle that was 2 inches in diameter. Each hour, the diameter will triple in size. If Sally doesn't do anything to stop the leak, how large will the puddle be after 10 hours?

$a = 2$

$b = 3$

$y = 2(3)^x$

$y = 2(3)^{10}$

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