Name: _____   Date: _____

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

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

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"?

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?

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

    a. Write an equation based on the information:

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

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

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?

5) Bacteria can multiply at an alarming rate when each bacteria splits into two new cells, thus doubling. For example, if we start with only one bacteria which can double every hour, by the end of one day we will have over 16 million bacteria.

End of Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	...	24
Bacteria - starting with one	2	4	8	16	32	64	128	256	512	1024	2048	4096	8192	16384	...	16777216

Write an equation for this scenario. Check your equation by plugging in 24 to see if you get 16,777,216.

6) Each year the local country club sponsors a tennis tournament. Play starts with 128 participants. During each round, half of the players are eliminated.

Rounds	1	2	3	4
Number of Players left	64	32	16	8

Write an equation for this scenario. How many players are left after 6 rounds?

7) The NCAA Division I Basketball tournament begins each year with a certain number of teams. After each round of games, the losing teams are cut from the tournament, so that each round has half as many teams playing as the previous round. After 3 rounds 8 teams are left. How many teams started out in the tournament?

8) An insect population triples every 4 months. If the population started out with 24 insects, how many insects would be there in 16 months?