Key

Math 1

Name_____

**4-4 Quick Practice**

Date_____

1. You drink a coffee with 140 mg of caffeine. Each hour, the caffeine in your system decreases by about 15%. Write a recursive rule that can be used to calculate the amount of caffeine in your system.

Recursive formula: $\begin{cases} C_0 = 140 \\ C_n = C_{n-1} \cdot 0.85 \end{cases}$

Domain: $X \rightarrow$ time  Any number $\geq 0$.

Range: Any number $\leq 140$

$Y \rightarrow$ caffeine

2. The foundation of your house has about 1,500 termites. The termites grow at a rate of about 3.4% per day. How long until the number of termites doubles?

$f(x) = 1500(1.034)^x$

$\frac{3.4}{100} = 0.034$

$3000 = 1500(1.034)^x$

Graph + find intersection!

$X = 20.7$  20.7 days

3. In 1985, there were 155 cell phone subscribers in the small town of Centerville. The number of subscribers increased by 65% per year after 1985. How many cell phone subscribers were in Centerville in 1994?

↳ 9 years later: $x = 9$

$c(x) = 155(1.65)^x$

$c(9) = 155(1.65)^9 \approx$ 14,050 subscribers

4. The population of Columbus, Ohio, can be modeled by $P(t)=822553(1.06)^t$ where $t$ is the number of years since 1990. What was the population in 1990? By what percent did the population increase by each year?

$t=0$ or initial amount

822,553 people in 1990.

The population increases by 6% each year.