

## Precalculus Unit 4: 4.5 Homework Worksheet

1. Find the future value of an investment of \$25,000 compounded continuously at 5% for 18 years.
2. How long will it take an investment to double in value if it is invested at 6.5% compounded continuously?

3. A culture of bacteria obeys the law of uninhibited growth. If 500 bacteria are present initially and there are 800 after 1 hour:

Find an equation that models this bacterial growth.

How many will be present in the culture after 5 hours?

How long is it until there are 20,000 bacteria?

4. The half-life of Radium is 1690 years. If 10 grams are present now, how much will be present in 80 years?

5. Salt (NaCl) decomposes in water to sodium ( $\text{Na}^+$ ) and chloride ( $\text{Cl}^-$ ) ions according to the law of uninhibited decay. If the initial amount of salt is 25 kilograms and after 10 hours, 15 kilograms of salt is left, how much salt is left after 1 day?

How long does it take until  $\frac{1}{2}$  kilogram of salt is left?

6. In a school with 1000 students, at 8 a.m., 80 people in the school have heard a rumor about an upcoming assembly. The rate at which the rumor spreads is given by the logistic function  $P(t) = \frac{1000}{1 + 11.5e^{-0.6106t}}$ , where  $t$  is the number of hours since 8 and  $P(t)$  is the number of students who have heard the rumor. How long will it take until 90% of the school has heard the rumor?

7. A recent earthquake in San Francisco measured 7.1 on the Richter scale. How many times more intense was the San Francisco earthquake earlier in the century that measured 8.3 on the Richter scale?