

Name Key

2-6-12

Int Alg II

4.6 Review

Find the amount of time it takes for each situation.

1. For \$2000 to be worth \$9000, invested at 7.45%, compounded monthly.
 $9000 = 2000 \left(1 + \frac{.0745}{12}\right)^{12t}$ $4.5 = 1.00620833^{12t}$ $12t \approx 243.0188932$
 $t \approx 20.3$ years

2. For \$3000 to be worth \$15,000 invested at 5.3% compounded semiannually.
 $15000 = 3000 \left(1 + \frac{.053}{2}\right)^{2t}$ $5 = 1.0265^{2t}$ $\log 5 = \log 1.0265^{2t}$ $2t \approx 61.53471723$
 $t \approx 30.8$ years

3. For \$4500 to be worth \$14,400 invested at 11.6% compounded continuously.
 $14400 = 4500 e^{.116t}$ $3.2 = e^{.116t}$ $\ln 3.2 = \ln e^{.116t}$ $\ln 3.2 = .116t$ $.116t \approx \ln 3.2$
 $t \approx 10$ years

4. For \$6,400 to be worth \$16,000 invested at 6.25% compounded continuously.
 $16000 = 6400 e^{.0625t}$ $2.5 = e^{.0625t}$ $\ln 2.5 = \ln e^{.0625t}$ $\ln 2.5 = .0625t$ $.0625t \approx \ln 2.5$
 $t \approx 14.7$ years

You invest \$10,000 in an account earning 8.8% interest. Determine the value of your money for each situation.

5. Compounded monthly for 40 years. \$33,3532.79

$A = 10000 \left(1 + \frac{.088}{12}\right)^{12 \cdot 40}$

6. Compounded weekly for 22 years. \$69,196.40

$A = 10000 \left(1 + \frac{.088}{52}\right)^{52 \cdot 22}$

Use the properties to simplify each.

7. $\log \sqrt{6} + \log \sqrt{24} = \log \sqrt{6 \cdot 24}$
 $\log \sqrt{3 \cdot 2 \cdot 2 \cdot 2 \cdot 3}$
 $\log 12$
 $\log 2 \cdot 2 \cdot 3$
 $\log 12$

8. $-4 \log \frac{1}{3} - \log 9 = \log \frac{1}{3}^{-4} - \log 9$
 $\log 3^4 - \log 9$
 $\log \frac{3^4}{9} = \log 9$

9. $\log 25 + \log 4 = \log 25 \cdot 4$
 $\log 100$
 $\log_{10} 100 = 2$

10. $2 \log 8 - \log 4 = \log 8^2 - \log 4$
 $\log \frac{64}{4} = \log 16$

11. $3 \log 2 + 2 \log 4 = \log 2^3 + \log 4^2$
 $\log 8 \cdot 16$
 $\log 128$

12. $-2 \log \frac{1}{2} + -4 \log \frac{1}{2} = \log \frac{1}{2}^{-2} + \log \frac{1}{2}^{-4}$
 $\log 2^2 + \log 2^4$
 $\log 4 + \log 16$
 $\ln 4 \cdot 16 = \log 64$

