

Solve the following. Round the answers to the nearest 100th if necessary.

- 1) $2^{3x+1} = 8^{4x-1}$ 2) $5^{2x-3} = 9^{x-2}$ 3) $3^{2x+1} = 7^{x+4}$ 4) $3^{4x+5} = 27^{5x+13}$
 5) $5^{2x} - 10 \cdot 5^x - 11 = 0$ 6) $e^{12-5x} - 7 = 123$ 7) $3^{2x} - 6 \cdot 3^x + 5 = 0$ 8) $e^{2x} - e^x - 6 = 0$
 9) $\log_{\frac{\sqrt{2}}{2}}(4x+7) + \log_{\frac{\sqrt{2}}{2}}(5) = \log_{\frac{\sqrt{2}}{2}}(3x-11)$ 10) $\ln(4x-10) - \ln(2x+3) = \ln(3)$
 11) $(\log x)^3 - (\log x)^2 - \log x^2 = 0$

Use the formula: $A = P\left(1 + \frac{r}{n}\right)^{nt}$ or $A = Pe^{rt}$ to answer the following questions. Round the answers to the nearest 100th.

- 12) Suppose you invested \$12,500 into a saving account with a 5.75% annual interest rate. How long will the investment take to growth to \$20,000 if the interest is compounded quarterly?
- 13) Suppose you invested \$7250 into a saving account with a 6.5% annual interest rate. How long will the investment take to growth to \$15,000 if the interest is compounded monthly?
- 14) Suppose you invested \$8000 into a saving account with a 8% annual interest rate is compounded continuously.
- a) How long will the investment take to double the value?
- b) How much longer (in years) would the investment take for the money to double if the interest is only compounded quarterly than if it were compounded continuously?
- 15) Suppose you invested \$2350 into a saving account that is compounded continuously for 7 years. What should the annual interest rate be in order to triple the amount invested?

Answers:

- 1) 4/9 2) 0.42 3) 26.60 4) -34/11 5) 1.49 6) 1.43 7) 0; 1.46 8) 1.10 9) no solution 10) no solution 11) 1; 100; 1/10
 12) 8.23 yrs 13) 11.22 yrs 14) a) 8.66 yrs b) 0.09 yrs longer 15) 15.69%