

Pre-Calculus

Sec. 3.4

Exponential and Logarithmic

Equations

(day 2)

Solving More Complex Log. Equations

$$\log A + \log B = C$$

1. **Combine** and **Isolate** the log.
2. Rewrite the equation in **exponential form**.
3. **Solve** and **check** for extraneous solutions.

Ex. 1: Solve for x.

a) $\log_5(x - 7) = 2$

b) $6 \ln(2x) = 30$

c) $\log_2 x + \log_2(x - 7) = 3$

$$d) \quad (\log x)^2 - \log x^3 + 2 = 0$$

$$e) \log_2(x-4) = 3$$

$$f) \log_2(x-1) + \log_2(x+1) = 3$$

$$g) \log_2 x + \log_4 x + \log_{16} x = 7$$

Ex. 2: How long will it take \$25,000 to grow to \$500,000 at 9% annual interest compounded monthly?

Ex.3 How long will an investment of \$30,000 take to grow to \$450,000 at 3% interest rate that is compounded quarterly?

Ex. 4: Suppose you invested \$6500 into a savings account with a 5.4% annual interest rate that is compounded continuously.

a) How long will the investment take to triple the value?

b) How much longer (in years) would the investment take for the money to triple if the interest is only compounded monthly?

Ex. 5: What should the annual interest rate be in order for \$1200 to grow to \$5200 in 8 years with continuous compounding?