2 Types of Log Equations

Type I. $\log_b X = \log_b Y$, then $X = Y$

Type II. $\log_b X = Y$, then $b^Y = X$

Strategy

Rewrite equations as either a single log equaling a number OR a single log equaling a single log, then use the appropriate Type I or Type II rule.

Example Solve $\log_2 (x+12) - \log_2 x = 2$

$$\log_2 (x + 12)/x = 2$$
$$(x + 12)/x = 2^2$$
$$(x + 12)/x = 4$$
$$x + 12 = 4x$$
$$12 = 3x$$
$$4 = x$$

Solve the following equations.

1. $\log_2 x + \log_2 (x - 2) = 3$

2. $\log_3 (x + 2) - \log_3 x = 3$

3. $\log_2 x + \log_2 (x - 4) = 6$

4. $3\log (x) - 5 = 4$

5. $\log (x^2 - 9) - \log (x + 3) = 1$

6. $\log (x + 6) - \log (x + 2) = \log x$

7. $\log 4x - \log(x - 3) = \log 2$

8. $\ln (2x + 5) + \ln x = \ln 7$

9. $\log_2 3x + \log_2 3 = \log_2 (2x + 15)$

10. $\ln e^x - 2\ln e = \ln e^4$