

## Unit 9 Objective 6 – Solving Log Equations

### A. A single log on each side of the equation

**Problem #3:**  $2 \log_8 x = \log_8 100$

$$\cancel{\log_8} x^2 = \cancel{\log_8} 100$$

$$x^2 = 100$$

$$x = \sqrt{100} = \pm 10 = \boxed{10}$$

### B. Two logs on one side and one log on the other

**Problem # 7:**  $\log x - \log (x - 5) = \log 6$

$$\cancel{\log} \frac{x}{x-5} = \cancel{\log} 6$$

$$\frac{x}{x-5} = 6$$

$$\begin{array}{r} 6x - 30 = x \\ -x + 30 \quad -x + 30 \\ \hline 5x = 30 \end{array}$$

$$x = 6 \quad \boxed{x = 6}$$

### C. Two logs on one side and no log on the other

**Problem #16:**  $\log_6 x + \log_6(x - 5) = 2$

$$\log_6 (x^2 - 5x) = 2$$

$$6^2 = x^2 - 5x$$

$$36 = x^2 - 5x$$

$$0 = x^2 - 5x - 36$$

$$(x-9)(x+4) = 0$$

$$\boxed{x = 9} \quad \cancel{x = -4}$$

$$\begin{array}{ccc} & -36 & \\ -9 & \times & 4 \\ & -5 & \end{array}$$