

PRE-AP ALGEBRA 2

3A.7 CLASSWORK

For problems 1 through 3, solve the indicated logarithmic equation for x . Be sure to check your solutions for logarithms of negative numbers.

1)

$$\log_4(x-3) + \log_4(x-8) = 3$$

$$\log_4[(x-3)(x-8)] = 3$$

$$\log_4(x^2 - 11x + 24) = 3$$

$$x^2 - 11x + 24 = 4^3 = 64$$

$$x^2 - 11x - 40 = 0$$

$$x = \frac{11 \pm \sqrt{(-11)^2 - 4(1)(-40)}}{2(1)} = \frac{1}{2}(11 \pm \sqrt{281})$$

$$x = \frac{1}{2}(11 - \sqrt{281}) = -2.8815$$

$$x = \frac{1}{2}(11 + \sqrt{281}) = 13.8815$$

2)

$$\log_3(x^2 - 2x - 15) = 2 + \log_3(x-5)$$

$$\log_3[(x-5)(x+3)] = 2 + \log_3(x-5)$$

$$\log_3(x-5) + \log_3(x+3) = 2 + \log_3(x-5)$$

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

$$x+3 = 3^2 = 9$$

$$x = 6$$

3)

$$\log_5(x+8) - \log_5(x-3) = 2$$

$$\log_5\left(\frac{x+8}{x-3}\right) = 2$$

$$\frac{x+8}{x-3} = 5^2 = 25$$

$$x+8 = 25(x-3) = 25x - 75$$

$$24x = 83$$

$$x = 3\frac{11}{24}$$