

Day 2 on 3-4Solve.

Ex 1)  $2(3^{2t-5}) - 4 = 11$

$$\begin{array}{r} +4 \quad +4 \\ \hline 8(3^{2t-5}) = 15 \\ \hline 2 \quad 2 \end{array}$$

$$\begin{array}{l} 3^{2t-5} = 7.5 \\ \log_3 3^{2t-5} = \log_3 7.5 \\ (2t-5)\log_3 3 = \log_3 7.5 \\ \hline \log_3 \quad \log_3 \end{array}$$

$$\begin{array}{r} 2t-5 = \frac{\log 7.5}{\log 3} \\ \hline +5 \quad +5 \\ \hline 2t = 1.834043767 + 5 \\ \hline 2 \quad 2 \\ \hline t \approx 3.417 \end{array}$$

Check  
your  
answers

Ex 2)  $\log_3 (5x - 1) = \log_3 (x + 7)$

$$\begin{array}{r} 5x-1 = x+7 \\ \hline -x \quad -x \\ \hline 4x-1 = 7 \\ \hline +1 \quad +1 \\ \hline 4x = 8 \\ \hline \frac{4}{4} \quad \frac{8}{4} \\ \hline x = 2 \end{array}$$

$$\text{Ex 3) } 2\log_5(3x) = 4$$

$$\frac{2}{2} \frac{\log_5(3x)}{2} = \frac{4}{2}$$

$$\log_5 3x = 2$$

$$3x = 5^2$$

$$\frac{3x}{3} = \frac{25}{3}$$

$$x = \frac{25}{3}$$

$$\text{Ex 4) } \ln(x-2) + \ln(2x-3) = 2\ln x$$

$$\ln[(x-2)(2x-3)] = 2\ln x$$

$$\ln(2x^2 - 7x + 6) = \ln x^2$$

$$\begin{array}{r} 2x^2 - 7x + 6 = x^2 \\ -x^2 \qquad \qquad -x^2 \\ \hline x^2 - 7x + 6 = 0 \end{array}$$

$$(x-6)(x-1) = 0$$

$$x-6=0$$

$$x=6$$

$$x-1=0$$

$$x=1$$

check

$$x=1 \Rightarrow \ln(1-2)$$

$$\ln -1$$

$x=1$  is not a solution

$$\text{Ex 5) } \log_{10} 4x - \log_{10} (12 + \sqrt{x}) = 2$$

$$\log_{10} \left( \frac{4x}{12 + \sqrt{x}} \right) = 2$$

$$\frac{4x}{12 + \sqrt{x}} = 10^2$$

$$\frac{4x}{12 + \sqrt{x}} = \frac{100}{1}$$

$$(4x)(1) = 100(12 + \sqrt{x})$$

$$4x = 1200 + 100\sqrt{x}$$

$$4x - 100\sqrt{x} - 1200 = 0$$

$$x - 25\sqrt{x} - 300 = 0$$

$$a=1 \quad b=-25 \quad c=-300$$

$$\sqrt{x} = \frac{-25 \pm \sqrt{(-25)^2 - 4(1)(-300)}}{2(1)}$$

$$\sqrt{x} = \frac{25 \pm \sqrt{1875}}{2}$$

$$(\sqrt{x})^2 = (33.860)^2$$

$$x \approx 1146.5$$