

# Section S.5: cont'd

Thursday, February 11, 2016  
10:33 AM

recall:  
if  $\log_a M = \log_a N$ ,  
then  $M = N$

solve:

$$\ln x - \ln(x-4) = \ln 3$$

$$\ln\left(\frac{x}{x-4}\right) = \ln 3$$

$$\frac{x}{x-4} = 3$$

$$x = 3(x-4)$$

$$x = 3x - 12$$

$$12 = 2x$$

$$x = 6$$

check:

$$\ln 6 - \ln 2 = \ln 3 \checkmark$$

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$$\log_3(1-x) + \log_3(x+4) = \log_3 2 + \log_3(1-2x)$$

$$\log_3(1-x)(x+4) = \log_3 2(1-2x)$$

$$(1-x)(x+4) = 2(1-2x)$$

$$4 - 3x - x^2 = 2 - 4x$$

$$0 = x^2 - x - 2$$

$$0 = (x+1)(x-2)$$

$$x = -1, 2$$

$$\{-1\}$$

check:  $x = -1$  ( $x = 2$  is extraneous)

$$\log_3 2 + \log_3 3 = \log_3 2 + \log_3 3 \checkmark$$

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brain teasers:

$$\log_3 (\log_4 x) = 0$$

$$\log_4 x = 3^0 = 1$$

$$x = 4^1$$

$$x = 4$$