

MTH 30

Homework

Section 3.3 / 4, 14, 26, 33, 48, 54, 68, 72, 76

#4 $\log_9 (9x) = 1 + \log_9 x$, because $\log_9 9 = 1$

#14 $\ln \left(\frac{e^4}{8} \right) = \ln e^4 - \ln 8 = 4 - \ln 8$

#26 $\log_8 \left(\frac{64}{\sqrt{x+1}} \right) = \log_8 64 - \log_8 \sqrt{x+1} = 2 - \frac{1}{2} \log_8 (x+1)$

#33 $\log_b \left(\frac{\sqrt{x} y^3}{z^3} \right) = \log_b (\sqrt{x} y^3) - \log_b z^3 =$
 $= \log_b \sqrt{x} + \log_b y^3 - \log_b z^3 =$
 $= \frac{1}{2} \log_b x + 3 \log_b y - 3 \log_b z$

#48 $\log (3x+7) - \log x = \log \left(\frac{3x+7}{x} \right)$

#54 $5 \log_b x + 6 \log_b y = \log_b x^5 + \log_b y^6 =$
 $= \log_b x^5 y^6$

#68 $\frac{1}{3} (5 \ln (x+6) - \ln x - \ln (x^2-25)) =$
 $= \frac{1}{3} \left(\ln (x+6)^5 - \ln x - \ln (x^2-25) \right) = \frac{1}{3} \ln \frac{(x+6)^5}{x(x^2-25)} =$
 $= \ln \sqrt[3]{\frac{(x+6)^5}{x(x^2-25)}}$

HW#11

p. 432-433) 8, 10, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100

72) $\log_6 17 = \frac{\log 17}{\log 6} \approx \boxed{1.5812}$

76) $\log_{0.3} 19 = \frac{\ln 19}{\ln 0.3} \approx \boxed{-2.4456}$

77) $x^2 - 10x + 25 = 0$
 $(x-5)^2 = 0$
 $x = 5$

78) $e^x = 0.93$ let's take ln of both sides
 $\ln(e^x) = \ln(0.93)$
 $x = \ln(0.93)$
 $x \approx -0.072$

79) $7^{2x+1} = 3$ let's take ln of both sides
 $\ln(7^{2x+1}) = \ln(3)$
 $(2x+1)\ln(7) = \ln(3)$
let's solve for x
 $2x\ln(7) + \ln(7) = \ln(3)$
 $2x\ln(7) = \ln(3) - \ln(7)$
 $x = \frac{\ln(3) - \ln(7)}{2\ln(7)}$
 $x = \frac{\ln(\frac{3}{7})}{2\ln(7)}$
 $x \approx \frac{\ln(0.4286)}{2\ln(7)}$
 $x \approx \frac{-0.847}{2(1.946)}$
 $x \approx \frac{-0.847}{3.892}$
 $x \approx -0.218$