Alg2 Homework, due Tuesday, Jan 30

On a separate sheet of paper, answer each question, showing as much of your work as possible.

Write each logarithmic expression as a single logarithm.

73. $\frac{1}{4}\log_3 2 + \frac{1}{4}\log_3 x$

74. $\frac{1}{2}(\log_x 4 + \log_x y) - 3\log_x z$

75. $2\log 3 - \frac{1}{2}\log 4 + \frac{1}{2}\log 9$

76. $x\log_4 m + \frac{1}{y}\log_4 n - \log_4 p$

77. $\left(\frac{2\log_b x}{3} + \frac{3\log_b y}{4}\right) - 5\log_b z$

78. $\frac{\log z - \log 3}{4} - 5\frac{\log x}{2}$

Expand each logarithm.

79. $\log\left(\frac{2\sqrt{x}}{5}\right)^3$

80. $\log\frac{m^3}{n^4 p^{-2}}$

81. $\log 2\sqrt{\frac{4r}{s^2}}$

82. $\log_b \frac{\sqrt{x}\sqrt[3]{y^2}}{\sqrt[5]{z^2}}$

83. $\log_4 \frac{\sqrt{x^5 y^7}}{zw^4}$

84. $\log\frac{\sqrt{x^2-4}}{(x+3)^2}$

85. $\log\sqrt{\frac{x\sqrt{2}}{y^2}}$

86. $\log_3\left[(xy)^{\frac{1}{3}} \div z^2\right]^3$

87. $\log_7 \frac{\sqrt{r+9}}{s^2 t^{\frac{1}{3}}}$

And, for extra credit:

Write each number in terms of natural logarithms, and then use the properties of logarithms to show that it is a rational number.

a. $\log_9(\sqrt{27})$

b. $\log_8(32)$

c. $\log_4\left(\frac{1}{8}\right)$