

# MEMORIAL UNIVERSITY OF NEWFOUNDLAND

## DEPARTMENT OF MATHEMATICS AND STATISTICS

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SECTION 4.5

Math 1090 Worksheet

FALL 2009

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**For practise only. Not to be submitted.**

1. Evaluate each of the following, if possible.

(a)  $\log_5(125)$

(b)  $\log_3(-81)$

(c)  $\log_2\left(\frac{1}{16}\right)$

(d)  $\log_9(3)$

(e)  $\log_4\left(\frac{1}{32}\right)$

(f)  $\log_3(9\sqrt{3})$

2. Simplify the following expressions.

(a)  $2^{5\log_2(3)}$

(b)  $9^{\log_3(7)}$

(c)  $\left(\frac{1}{2}\right)^{\log_4(5)}$

(d)  $e^{3\ln(x)}$

3. Expand  $\log_2\left(\frac{x^3 4^y}{2\sqrt{z}}\right)$  as much as possible.

4. Express  $\ln(x) + \frac{1}{2}\ln(y) - 5\ln(z)$  as a single logarithm.

5. Solve each of the following logarithmic equations.

(a)  $\log_4(x+3) = 2 - \log_4(x-3)$

(b)  $\frac{1}{2}\ln(7-3x) - \ln(1-x) = 0$

(c)  $\log_2(x) - \log_2(2x-5) = 3 - \log_2(x+3)$

6. Solve each of the following exponential equations.

(a)  $6^{x-1} = 3$

(b)  $5^{2x+1} = 3 \cdot 4^{-x}$

(c)  $e^{2x} = 3e^x + 4$