Mustang Race

1. Write the following in exponential form:

   (a) $\log_3 x = 9$

   (b) $\log_2 8 = x$

   (c) $\log_3 27 = x$

   (d) $\log_4 x = 3$

   (e) $\log_2 y = 5$

   (f) $\log_5 y = 2$

2. Write the following in logarithmic form:

   (a) $y = 3^4$

   (b) $27 = 3^x$

   (c) $m = 4^2$

   (d) $y = 3^5$

   (e) $32 = x^5$

   (f) $64 = 4^x$

3. Solve the following for the indicated variable (non-calculator):

   (a) $\log_3 x = 4$

   (b) $\log_m 81 = 4$

   (c) $\log_x 1000 = 3$

   (d) $\log_2 \frac{x}{2} = 5$

   (e) $\log_3 y = 5$

   (f) $\log_2 4x = 5$

4. Solve the following for x:

   (a) $\ln x = 2.7$

   (b) $\ln(x + 1) = 1.86$

   (c) $6.27 = e^x$

   (d) $4.12 = e^{-2x}$

5. Evaluate (non-calculator):

   (a) $\log_{10} 1000$

   (b) $\log_4 1$

   (c) $\log_3 27$

   (d) $\log_2 \frac{1}{4}$

   (e) $\log_a a^x$

6. Solve the following for x (non-calculator):

   (a) $\log_4 x = 2$

   (b) $\log_{10}(2x + 1) = 2$

   (c) $\log_2 64 = x$

   (d) $\log_b 81 = 4$

ANSWERS:

1. **(a)** $3^9 = x$

   (b) $2^x = 8$

   (c) $3^x = 27$

   (d) $4^3 = x$

   (e) $2^5 = y$

   (f) $5^2 = y$

2. **(a)** $\log_3 y = 4$

   (b) $\log_3 27 = x$

   (c) $\log_4 m = 2$

   (d) $\log_3 y = 5$

   (e) $\log_x 32 = 5$

   (f) $\log_4 64 = x$

3. **(a)** $x = 81$

   (b) $m = 3$

   (c) $x = 10$

   (d) $x = 64$

   (e) $y = 243$

   (f) $x = 8$

4. **(a)** $x = 14.880$

   (b) $x = 5.424$

   (c) $x = 1.836$

   (d) $x = -.708$

5. **(a)** 3

   (b) 0

   (c) 3

   (d) –2

   (e) x

6. **(a)** $x = 16$

   (b) $x = 49.5$

   (c) $x = 6$

   (d) $b = 3$