6.13 Day 2

Always remember...

LOGS are E X P O N E N T S !!!

Exponential Form

$y = b^x$ ← exponent

power → y

base b

Log Form

$\log_b y = x$

power y, exponent x

base b

① Convert from exponential to log form:

a) $m = n^p$ → $\log_n m = p$

b) $k = j^h$ → $\log_j k = h$

c) $32 = 2^5$ → $\log_2 32 = 5$

② Convert from log to exponential form.

a) $\log_2 8 = x$ → $8 = 2^x$

b) $\log_5 125 = x$ → $125 = 5^x$

c) $\log_3 \left(\frac{1}{9}\right) = x$ → $3^x = \frac{1}{9}$

③ Simplify. Evaluate when possible.

a) $\log_3 9 + \log_3 27$

$2 + 3$

(5)

b) $\log_2 8 - \log_2 4$

$3 - 2$

(1)

c) $\log_5 25 + \log_5 5$

$2 + 1$

3

d) $\log_2 64 - \log_2 8$

$6 - 3$

3

You Try!

e) $\log_2 8 + \log_4 16 - \log_2 16$

$3 + 2 - 4$

1

f) $\log_3 81 - \log_3 27 - \log_3 3$

$4 - 3 - 1$

0

g) $2\log_5 625 + \log_{865} 1$

$2(4) + 0$

$8 + 0$

8

h) $-\frac{1}{2}\log_5 25 + \frac{1}{3}\log_{10} 1000$

$-\frac{1}{2}(2) + \frac{1}{3}(3)$

$-1 + 1$

0

i) $\frac{1}{2}\log_5 5 + \log_5 \sqrt[4]{5}$

$\frac{1}{2}(1) + \log_5 5^{1/4} = x$

$\frac{1}{2} + \frac{1}{4}$

$\frac{3}{4}$

④ Solve for x.

a) $\log_2 x = 4$

$2^4 = x$

$16 = x$

b) $\log_5 x = 3$

$5^3 = x$

$125 = x$

⑤ Approximate the solutions to the following equations:

a) $5^x = 27$ x is between 2 and 3 but is closer to 2

b) $3^x = 42$

$3 < x < 4$

c) $10^x = 300$

$2 < x < 3$

d) $\log_2 17 = x$

e) $\log_2 \frac{1}{5} = x$

d) $\log_2 17 = x$

$2^x = 17$

$4 < x < 5$

e) $\log_2 \frac{1}{5} = x$

$2^x = \frac{1}{5}$

$-3 < x < -2$

f) $\log_4 57 = x$

(6) Find the exact solutions to the following equations using your calculator. Round to the nearest hundredth.

a) $\frac{3 \cdot 4^{x-2}}{3} = \frac{18}{3}$

$4^{x-2} = 6$

$y_1 \quad y_2$

Find intersection:
2nd Trace
#5 intersection

$x \approx 3.29$

b) $2^x - 6 = 3x + 5$

$x \approx 4.63$

$x \approx -3.64$

c) $8x = 7 \log_{10} 3$

d) $-\frac{2}{5}x = 6 - \log 19$

e) $\log 10{,}000 = -x$