

## Warm Up

Solve for x:

1.)  $\log x = 4$

2.)  $\ln 4x = 3$

3.)  $\log_5 340 = 2x$

4.)  $\log_6 4x = \log_6 12$

5.)  $\log 2x + \log 3 = \log 42$

6.)  $\ln(x + 5) + 2\ln 9 = \ln 810$

7.)  $2\log_4 16x - 3\log_4 2 = 5$

## Warm Up

Solve for x:

1.)  $\log x = 4$

$$10^4 = x$$

$$\boxed{10,000 = x}$$

2.)  $\ln 4x = 3$

$$e^3 = 4x$$

$$\boxed{5.021 = x}$$

3.)  $\log_5 340 = 2x$

$$\boxed{x = 1.811}$$

4.)  $\log_6 4x = \log_6 12$

$$4x = 12$$

$$\boxed{x = 3}$$

$$5.) \log 2x + \log 3 = \log 42$$

$$\log 6x = \log 42$$

$$6x = 42$$

$$x = 7$$

$$6.) \ln(x + 5) + 2\ln 9 = \ln 810$$

$$\ln 81(x+5) = \ln 810$$

$$\ln(81x + 405) = \ln 810$$

$$81x + 405 = 810$$

$$81x = 405$$

$$x = 5$$

$$7.) 2\log_4 16x - 3\log_4 2 = 5$$

$$\log_4 256x^2 - \log_4 8 = 5$$

$$\log_4 \frac{256x^2}{8} = 5$$

$$4^5 = 32x^2$$

$$1024 = 32x^2$$

$$32 = x^2$$

$$x = 5.657$$

$$1) \log_3 x = 5$$

$$3^5 = x$$

$$243 = x$$

$$2) \log_2 x = 3$$

$$2^3 = x$$

$$8 = x$$

$$3) \log_{1/4} x = 3$$

$$\left(\frac{1}{4}\right)^3 = x$$

$$\frac{1}{64} = x$$

$$4) \log_b 3 = 1/2$$

$$b^{1/2} = 3$$

$$b = 9$$

$$5) \log_6 (4x + 12) = 2$$

$$6^2 = 4x + 12$$

$$36 = 4x + 12$$

$$24 = 4x \quad \boxed{x = 6}$$

$$7) \log_{10} 27 = 3 \log_{10} x$$

$$\log 27 = \log x^3$$

$$27 = x^3$$

$$\boxed{x = 3}$$

$$6) \log_3 (x + 2) = \log_3 (3x)$$

$$x + 2 = 3x$$

$$2 = 2x$$

$$\boxed{x = 1}$$

$$8) \log_4 5 + \log_4 x = \log_4 60$$

$$\log_4 5x = \log_4 60$$

$$5x = 60$$

$$\boxed{x = 12}$$

$$\log_5 y - \log_5 8 = \log_5 1$$

$$10) \log_9 4 + 2 \log_9 5 = \log_9 w$$

$$) \log_{10} x + \log_{10} (3x - 5) = \log_{10} 2$$

$$15) 3 \log_4 6 - \log_4 8 = \log_4 x$$

$$) \log_2 4 - \log_2 (x + 3) = \log_2 8$$

$$17) 2 \log_4 (x + 1) = \log_4 (11 - x)$$

$$\textcircled{3} \log_2 x - \textcircled{2} \log_2 5x = 2$$

$$\log_2 x^3 - \log_2 25x^2 = 2$$

$$\log_2 \frac{x}{25} = 2$$

$$2^2 = \frac{x}{25}$$

$$4 = \frac{x}{25}$$

$$\boxed{x = 100}$$

$$\frac{x^3}{x^2} = x$$

$$19) \log_5 (x + 3) - \log_5 (2x - 1) = 2$$

$$) \log_3 2c = -2$$

$$3^{-2} = 2c$$

$$\frac{1}{9} = 2c$$

$$\frac{1}{18} = c$$

$$) \log_8 (x - 5) = 2/3$$

$$8^{2/3} = x - 5$$

$$4 = x - 5$$

$$\boxed{x = 9}$$

$$21) \log_{25} (x/2) = 1/2$$

$$25^{1/2} = \frac{x}{2}$$

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

$$\boxed{x = 10}$$

$$23) \log_2 (x^2 - 6) = \log_2 (2x + 2)$$

$$24) \log_2 (x + 3) = 4$$

$$25) \log_5 4 + \log_5 2x = \log_5 24$$

## Unit 8: Exponentials & Logarithms

# Mixed Practice

Finance  
Exponential Word Problems

Exponential  
Logarithmic  
Equations

**Solve.**

**c)  $3^{x+2} = 12$**

$$\log_3 12 = x + 2$$

$$2.262 = x + 2$$

$$\boxed{0.262 = x}$$

**d)  $5^{x+1} = 62$**

$$\log_5 62 = x + 1$$

$$2.564 = x + 1$$

$$\boxed{1.564 = x}$$

**b.  $\log_{10}(2x + 5) = \log_{10}(5x - 4)$**

$$2x + 5 = 5x - 4$$

$$5 = 3x - 4$$

$$9 = 3x$$

$$\boxed{x = 3}$$

c.  $\log_3(4x + 5) - \log_3(3 - 2x) = 2$

$$\log_3 \frac{4x+5}{3-2x} = 2$$

$$3^2 = \frac{4x+5}{3-2x}$$

$$9(3-2x) = 4x+5$$

$$\begin{array}{r} 27 - 18x = 4x + 5 \\ -5 \qquad \qquad +18x \end{array}$$

$$22 = 22x \rightarrow \boxed{x=1}$$

## QUIZ!

Round to 3 places

Animal group names:

ex.) whales  $\rightarrow$  pod

geese  $\rightarrow$  gaggle