

p. 32-33 Solving Log Equations by Rewriting 7.4

Fill in the Blanks

p. 33

1. $2^{\boxed{5}} = 32$

2. $3^{\boxed{-2}} = \frac{1}{9}$

3. $28^{\boxed{0}} = 1$

4. $10^{\boxed{3}} = 1,000$

Exponential equations can be rewritten as logarithm equations

What is a logarithm?

Exponential Form

$$b^x = y$$

Logarithmic Form

$$\log_b y = x$$

Ex: $4^2 = 16 \longleftrightarrow \log_4 16 = 2$

Exponential Form

$$b^x = y$$

Logarithmic Form

$$\log_b y = x$$

$$4^2 = 16 \longleftrightarrow \log_4 16 = 2$$

Rewrite in exponential form.

1) $\log_5 625 = 4$

2) $\log_2 \frac{1}{8} = -3$

3) $\log_5 125 = 3$

$5^4 = 625$

$2^{-3} = \frac{1}{8}$

$5^3 = 125$

Rewrite in logarithmic form.

4) $10^4 = 10,000$

5) $6^{-2} = \frac{1}{36}$

$\log_{10} 10,000 = 4$

$\log_6 \frac{1}{36} = -2$

Solve each equation by rewriting to exponential form. p. 32
 Note: your equation must first be in logarithm form.

1) $\log_3 x = 5$

$$3^5 = x$$

$$243 = x$$

2) $\frac{4\log_2 x}{4} = \frac{-12}{4}$

$$\log_2 x = -3$$

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

$$x = .125 = \frac{1}{8}$$

3) $\log_5(x + 10) = 2$

$$5^2 = x + 10$$

$$\begin{array}{r} 25 = x + 10 \\ -10 \quad -10 \end{array}$$

$$15 = x$$

4) $\frac{3\log_{10}(x - 400)}{3} = \frac{9}{3}$

$$\log_{10}(x - 400) = 3$$

$$10^3 = x - 400$$

$$\begin{array}{r} 1000 = x - 400 \\ +400 \quad +400 \end{array}$$

$$1400 = x$$

5) $\log_6(2x - 1) = 2$

$$6^2 = 2x - 1$$

$$36 = 2x - 1$$

$$\begin{array}{r} 36 = 2x - 1 \\ +1 \quad +1 \end{array}$$

$$\frac{37}{2} = \frac{2x}{2}$$

$$18.5 = x$$

6) $\frac{4\log_2(2x)}{4} = \frac{16}{4}$

$$\log_2(2x) = 4$$

$$2^4 = 2x$$

$$\frac{16}{2} = \frac{2x}{2}$$

$$8 = x$$

Homework: Rewriting and Simple Solving