6-6 Reteach to Build Understanding

Exponential and Logarithmic Equations

Property of Equality for Exponential Equations:

Suppose $b > 0$ and $b \neq 1$, then $b^x = b^y$ if only if $x = y$.

Property of Equality for Logarithmic Equations:

If $x > 0$, then $\log_b x = \log_b y$ if only if $x = y$.

1. For parts (a)–(d), refer to the properties above. Find your answer in the answer box. Write the correct answer in the blanks to show the solution of each question that was started.

$\frac{3}{2}$	2	9	−9	−7	18	−2	137	1

a. $28 = 8^x$

$\log 28 = x(\log 8)$

$x = \dfrac{\log 28}{\log 8} = 1.6025$

d. $\log_7(\underline{\quad}) = \log_7 7x$

$137 = 7x$

$x = \dfrac{137}{7}$

b. $\log(x^2 - 2) = \log(-x)$

$x^2 + x - 2 = 0$

$(x + 2)(x - 1) = 0$

$x = \underline{\quad}$; the value _____ is an extraneous solution.

e. $8^{x+9} = 64$

$8^{x+9} = 8^2$

$x + 9 = \underline{\quad}$

$x = \underline{\quad}$

c. $6^{2x} = 216$

$6^{2x} = 6^3$

$x = \underline{\quad}$

f. $\log_3(2x) = \log_3 18$

$2x = \underline{\quad}$

$x = \underline{\quad}$

2. Find and correct the student error in the solution of the logarithmic equation.

$\ln(2x + 3) + \ln x = \ln(1 + 4x)$

$(2x + 3) + x = 1 + 4x$

a. Identify the error and explain the error the student made.

b. Find the correct solution of the logarithmic equation. Select all that apply.

Ⓐ $-\dfrac{1}{2}$ Ⓒ $\dfrac{1}{2}$

Ⓑ -1 Ⓓ 1