Practice Problem 1

The function g is given by $g(x) = 8 \cdot 2^x$. Which of the following is an equivalent form for $g(x)$?

(a) $g(x) = 2^{x-3}$

(b) $g(x) = 2^{x+3}$

(c) $g(x) = 2^{3x}$

(d) $g(x) = 2^{x/3}$

Practice Problem 2

In the *xy*-plane, the function f, given by $f(x) = 4^{x-2}$, is a horizontal translation of the exponential function g, given by $g(x) = 4^x$. Which of the following is an equivalent form for $f(x)$ that expresses f as a vertical dilation of g?

(a) $f(x) = \frac{1}{16} + 4^x$

(b) $f(x) = 16 \cdot 4^x$

(c) $f(x) = 16 \cdot \left(\frac{1}{4}\right)^x$

(d) $f(x) = \left(\frac{1}{16}\right) \cdot 4^x$

Practice Problem 1 Solution:

(b) $g\left(x\right)=2^{x+3}$

Using the property: $a^{x+y}=a^{x}\cdot a^{y}$, you can rewrite $8\cdot 2^{x}=2^{3}\cdot 2^{x}=2^{x+3}$.

Practice Problem 2 Solution:

(d) $f\left(x\right)=\left(\frac{1}{16}\right)\cdot 4^{x}$

Using the property: $a^{x+y}=a^{x}\cdot a^{y}$, you can rewrite $4^{x-2}=4^{x}\cdot 4^{-2}=\frac{1}{16}\cdot 4^{x}$. The function $f\left(x\right)=\left(\frac{1}{16}\right)\cdot 4^{x}$ represents a vertical dilation of the function $g\left(x\right)=4^{x}$ by a factor of $\frac{1}{16}$.