## Chapter 7.1, Problem 23E

**Problem** 

If b and y are positive real numbers such that logb y = 3, what is log1/b(y)? Why?

Step-by-step solution

## Step 1 of 1

Suppose that b and y are positive integers, with  $\log_b y = 3$ 

 $\Rightarrow b^{3} = y \text{ [from the definition of a logarithm]}$  $\Rightarrow b^{-3} = y^{-1}$  $\Rightarrow \frac{1}{b^{3}} = y^{-1}$  $\Rightarrow \left(\frac{1}{b}\right)^{3} = y^{-1}$  $\Rightarrow \log_{\left(\frac{1}{b}\right)} y^{-1} = 3$  $\Rightarrow -1.\log_{\left(\frac{1}{b}\right)} y = 3$  $\therefore \log_{\left(\frac{1}{b}\right)} y = -3$ 

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