Chapter 7.1, Problem 20E

Problem

Use the definition of logarithm to prove that for any positive real number b with $b \neq 1$, $\log b\ 1 = 0$.

Step-by-step solution

Step 1 of 1

The objective is to prove $\log_b 1 = 0$ for any positive real number $b(\neq 1)$.

By the definition of the logarithm, if $a^x = y$ then,

$\log_a y = x.$

Let b be any positive real number with $b \neq 1.$

For a positive real number $b,$

$b^0 = 1.$

This is similar to $a^x = y.$

By the definition of logarithm,

$\boxed{\log_b 1 = 0}.$

Since, $\log_a y = x.$