Problem

If *b* and *y* are positive real numbers such that log_b *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 $\log_b y = 3$

$\Rightarrow b^3 = y$ [from the definition of a logarithm]

$\Rightarrow b^{-3} = y^{-1}$

$\Rightarrow \dfrac{1}{b^3} = y^{-1}$

$\Rightarrow \left(\dfrac{1}{b}\right)^3 = y^{-1}$

$\Rightarrow \log_{\left(\frac{1}{b}\right)} y^{-1} = 3$

$\Rightarrow -1 \cdot \log_{\left(\frac{1}{b}\right)} y = 3$

$\therefore \log_{\left(\frac{1}{b}\right)} y = -3$