

Answer on Question #79204 – Math – Calculus

Question

Which of the following could be an example of a function with a range $(-\infty, a]$ and a domain $[b, \infty)$ where $a > 0$ and $b > 0$?

Solution

Consider the function

$$f(x) = -3\sqrt{x-b} + a$$

Find the domain.

$$x - b \geq 0 \Rightarrow x \geq b$$

Domain: $[b, \infty)$

Find the range

$$\sqrt{x-b} \geq 0 \Rightarrow -3\sqrt{x-b} \leq 0 \Rightarrow -3\sqrt{x-b} + a \leq a$$

Range: $(-\infty, a]$

The function $f(x) = -3\sqrt{x-b} + a$ could be an example of a function with a range $(-\infty, a]$ and a domain $[b, \infty)$ where $a > 0$ and $b > 0$.