

8.6 Solving Logarithmic Equations



"I can solve and check any equation with logarithmic expressions.
I also know what the restrictions are in an equation."

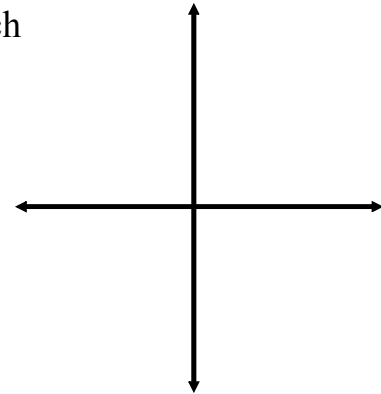
Recall: Given: $y = \log_b x$.

$$D: \{x \in R \mid x > 0\}$$

$$R: \{y \in R\}$$

$$b > 0, b \neq 1$$

Sketch



Since the domain of $y = \log_b x$ is $D: \{x \in R \mid x > 0\}$, when solving equations involving logarithms, one must always identify the restrictions on x . It is best to do this as soon as possible.

For example, if one is asked to solve $\log_5(2x - 5) = \log_5 7$, then whatever the final solution is for x , it must be greater than $\frac{5}{2}$.

Ex. 1: Solve: $\log_5(2x - 5) = \log_5 7$

Ex. 2: Solve:

a) $\log_3(x - 4) + \log_3 5 = \log_3 10$

b) $\log_2(x - 3) + \log_2(x + 4) = 3$