4.5: Logarithmic and Exponential Equations

Supplementary Notes

Recall, $x = \log_a y \Leftrightarrow y = a^x$.

The following additional properties are useful for solving logarithmic and exponential equations, for $a > 0$, $a \neq 1$, and real numbers s, t

- $a^s = a^t$ if and only if $s = t$
- $\log_a s = \log_a t$ if and only if $s = t > 0$

Exercises

1. Find all x such that $\log_4 32^x = -1$.
2. Find all x such that $\log_3(1 - 2x) + \log_3(2 + x) = 1$.
3. Find all x such that $\log_9(x^2 - 4) - \log_3(x - 2) = 1$.