

Warm-up!

Find the inverse of the following functions:

A) $f(x) = 3 \log_2(x + 4)$

B) $g(x) = 2 - \ln\left(\frac{x}{5}\right)$

Log Functions Day 6:

- (2.13) Inverse of Log Functions
- (2.13) Exponential Inequalities
- (2.13) Log Inequalities

Homework: Exponential and log inequalities

Let $f(x) = 2 - \log_3(x - 5)$

Find $f^{-1}(x)$

Find the vertical asymptote of $f(x)$. Describe this asymptote with a limit statement.

Find the horizontal asymptote of $f^{-1}(x)$. Describe this asymptote with a limit statement.

Let $g(x) = 5 \log(20 - x)$

Find $g^{-1}(x)$

Find the domain and range of g

Find the domain and range of g^{-1}

Find $g(10)$

Find $g^{-1}(10)$

Strategy for All Inequality Problems

(Before you begin, draw a number line that reflects the domain of any function in the inequality. Cross off/erase parts of the number line that are not in the domain)

1. Solve the equality
2. Put solutions on number line
3. Test regions

Let $f(x) = \log_2(11 - x)$ and $g(x) = \log_2(x - 5) - 1$

Find all x -values for which $f(x) \geq g(x)$

(Before you begin, draw a number line that reflects the domain of any function in the inequality. Cross off/erase parts of the number line that are not in the domain)

1. Solve the equality
2. Put solutions on number line
3. Test regions

Let $f(x) = \log_2(x^2 + 4)$ and let $g(x) = \log_2(x + 16)$

What are all values of x for which $f(x) \geq g(x)$?

(Before you begin, draw a number line that reflects the domain of any function in the inequality. Cross off/erase parts of the number line that are not in the domain)

1. Solve the equality
2. Put solutions on number line
3. Test regions

Let $f(x) = 8^{2x-1}$ and let $g(x) = 4^{x-5}$

Find the interval(s) over which $f(x) < g(x)$

Let $f(x) = \log_2(|x - 5|)$

Find all values of x for which the output of $f(x)$ is negative

Let $f(x) = 3(2)^{1-x} + 6$

Find all x -values for which $f(x) \geq 15$