

Worksheet 6

1) For which b is $\log_b(x)$

(i) increasing

(ii) decreasing

2) Evaluate
$$\frac{\log_3 \sqrt{243 \sqrt{81 \sqrt[3]{3}}}}{\log_2 \sqrt[4]{64}}$$

3) Solve for x

(a) $2 \log_b x = 2 \log_b(1-a) + 2 \log_b(1+a) - \log_b \left(\frac{1}{a} - a\right)^2$

(b) $\log_b x = 2 - a + \log_b \left(\frac{a^2 b^a}{b^2}\right)$

4) Find the domain of

(a) $f(x) = \log_2 \left(\frac{x-1}{x^2-4}\right)$

(b) $f(x) = \log_3(3x+5) - \log_3(-x)$

5) Find the inverse function for

(a) $f(x) = \frac{2^x - 2^{-x}}{2}$ (Hint: Write $y = \frac{2^x - 2^{-x}}{2}$, substitute $t = 2^x$, solve for t using quadratic formula, then solve for x using logarithm.)

(b) $f(x) = \log_2(\log_2(x))$