

Block 5: Exponentials

Problem 1: Solve in \mathbb{R} :

a) $3^x + 3^{x+1} - 5^{x-1} = 5^x - 3^{x+3} + 5^{x+2}$

b) $\left(\frac{4}{25}\right)^{x+3} \cdot \left(\frac{125}{8}\right)^{4x-1} = \frac{5}{2}$

c) $4^x - 2^{x+1} - 8 = 0$

d) $5^{1-x} = 7^{x-1}$

e) $2^{x+1} + 3 \cdot 2^{2+x} \leq 2^{x+5}$

Problem 2: Sketch a graph of a function:

a) $y = 2^x$

b) $y = 3^{-x}$

c) $y = \left(\frac{1}{3}\right)^x$

d) $y = \log_2 x$

e) $y = \log_{0.5} x$

Block 6: Logarithms

Problem 1: Find:

a) $(\sqrt{2})^{\log_2 \frac{1}{4} + 2\log_{10} 100} + \frac{1}{3} \log_3 27 - \log_3 1$

b) x , if $\log_{\frac{1}{3}} x = -\frac{2}{5}$,

c) x , if $\log_x \frac{27}{2} = -2$,

Problem 3: Solve:

a) $\log_{10} x + \frac{3}{\log_{10} x} = 4$,

b) $\log_{10} \sqrt{x+1} + \log_{10} \sqrt{x-1} = 2 - \log_{10} 2$,

c) $\frac{5\log_{10} x + 3}{3\log_{10} x - 4} = \frac{\log_{10} x + 5}{3\log_{10} x - 4} - 2$,

d) $\log_{0.5} (\log_{0.2}(x) + 2) < 3$

e) $\log_3 (3 + \log_2(x)) < 3$

f) $\log_3 (\log_{0.5} (\log_{10}(x))) > 1$