

Logarithms Worksheet – YEAR 10

(A) Solve for x :

(i) $10^x = 1000$

(ii) $10^{2x-5} = 100$

(iii) $4^x = 32$

(B) Solve for x :

(i) $10^x = 300$

(ii) $10^{2x-3} = 666$

(iii) $10^{2-x} = 0.5$

(iv) $5^{2x} = 88$

(C) Solve for x :

(i) $\log_{10}(x) = 3$

(ii) $\log_{10}(2x-3) = 2$

(iii) $\log_2(3x+2) = 5$

(iv) $\log_5(4x-1) = 2$

(D) Make x the subject of the following equations:

(i) $10^x = y$

(ii) $\log_b(x+a) = y$

(iii) $5a^{x-b} = 15$

(E) Evaluate:

(i) $\log_{10} 100 =$

(ii) $\log_2 16 =$

(iii) $\log_{10} 1 =$

(iv) $\log_5 5 =$

(v) $\log_8 16 =$

(vi) $\log_5 0.04 =$

(F) Use the log laws to simplify the following:

(i) $\log x + \log x + \log x =$

(ii) $\log x + 2 \log y =$

(iii) $\log ab - \log 2b =$

(iv) $4 \log x + 3 \log y =$

(v) $\log a^2 + 2 \log b - 3 \log a =$

(vi) $\log(x^2 - 1) - \log(x + 1) =$

(vii) $2 \log x + \log(x + 1) =$

(viii) $\log \frac{1}{b} - 2 \log \frac{1}{a} =$

ANSWERS:

(A) i) $x = 3$ ii) $x = 3.5$ iii) $x = 2.5$ (B) i) $x = 2.477$ ii) $x = 2.912$ iii) $x = 2.301$

iv) $x = 1.391$ (C) i) $x = 1000$ ii) $x = 51.5$ iii) $x = 10$ iv) $x = 6.5$

(D) i) $x = \log_{10} y$ ii) $x = b^y - a$ iii) $x = b + \log_a 3$

(E) i) 2 ii) 4 iii) 0 iv) 1 v) $\frac{4}{3}$ vi) -2

(F) i) $\log x^3$ ii) $\log(xy^2)$ iii) $\log\left(\frac{a}{2}\right)$ iv) $\log(x^4 y^3)$ v) $\log\left(\frac{b^2}{a}\right)$

vi) $\log(x - 1)$ vii) $\log(x^3 + x^2)$ viii) $\log\left(\frac{a^2}{b}\right)$