
Show all work to receive full credit. No Work = No Credit.

NO CALCULATORS ALLOWED ON THIS QUIZ

1. Calculate the following:

(a) $\log_3 27 = 3$ since $3^3 = 27$

(b) $\log \frac{1}{10} = -1$ since $10^{-1} = \frac{1}{10}$

(c) $\ln e^{29} = 29$ since $e^{29} = e^{29}$

(d) $\log_2 \frac{1}{\sqrt{2}} = -\frac{1}{2}$ since $2^{-\frac{1}{2}} = \frac{1}{2^{\frac{1}{2}}} = \frac{1}{\sqrt{2}}$

2. Solve the following equations:

(a) $4 \cdot 6^{3x} = 12$

$$6^{3x} = 3$$

$$\ln 6^{3x} = \ln 3$$

$$3x \ln 6 = \ln 3$$

$$x(3 \ln 6) = \ln 3$$

$$x = \frac{\ln 3}{3 \ln 6}$$

(b) $\log_2(x+3) + \log_2 x = 3$

$$\log_2(x(x+3)) = 3$$

$$2^3 = x(x+3)$$

$$8 = x^2 + 3x$$

$$0 = x^2 + 3x - 8$$

$$x = \frac{-3 \pm \sqrt{9 - 4(-8)}}{2}$$

$$x = \frac{-3 \pm \sqrt{9 + 32}}{2}$$

$$x = \frac{-3 \pm \sqrt{42}}{2}$$

$\frac{-3 - \sqrt{42}}{2}$ is negative, so it is not in the domain. Therefore the solution is

$$x = \frac{-3 + \sqrt{42}}{2}$$