

Quiz 14

Solutions given without showing work may earn a zero. This quiz is closed-book, but you may use a calculator.

Solve each equation for x . Round all answers to 2 decimal places.

Problem 1. [3 points] $2^{2x-1} = 16$

Problem 2. [3 points] $\log(x) - \log(4) = \log(8)$

Problem 3. [4 points] $\log_3(x-4) + \log_3(x+4) = 2$

$$\begin{aligned} \textcircled{1} \quad 2^{2x-1} &= 16 \\ \cancel{2}^{2x-1} &= \cancel{2}^4 \\ 2x-1 &= 4 \\ 2x &= 5 \\ x &= \frac{5}{2} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad \log x - \log 4 &= \log 8 \\ \cancel{\log} \left(\frac{x}{4} \right) &= \cancel{\log} 8 \\ \frac{x}{4} &= 8 \\ x &= 32 \end{aligned}$$

$$\begin{aligned} \text{ck: } \log 32 - \log 4 &= 0.90 \\ \log 8 &= 0.90 \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad \log_3(x-4) + \log_3(x+4) &= 2 \\ \log_3((x-4)(x+4)) &= 2 \\ * \text{ Rewrite as an exponent} \end{aligned}$$

$$3^2 = (x-4)(x+4)$$

$$9 = x^2 - 4x + 4x - 16$$

$$9 = x^2 - 16$$

$$25 = x^2$$

$$\pm 5 = x$$

$$\text{ck: } x=5: \log_3 1 + \log_3 9 = 2 \quad \checkmark$$

$$x=-5: \log_3(-9) + \log_3(-1) \quad \text{DNE}$$

$$x = 5$$