Quiz 12
Total Points possible: 10 out of 10
Math 12: Spring 2025

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Instructions: Show all your work in order to receive credit.

Problem 1. (3.3 points) Let $f(x) = \left(\frac{4}{3}\right)^x$. Find both $g(-3)$ and $g(3)$.

$$g(3) = \left(\frac{4}{3}\right)^3 = \frac{4^3}{3^3}$$

$$= \frac{4 \cdot 4 \cdot 4}{3 \cdot 3 \cdot 3}$$

$$= \frac{64}{27}$$

$$g(-3) = \left(\frac{4}{3}\right)^{-3}$$

the negative exponent flips the fraction

$$= \left(\frac{3}{4}\right)^3$$

$$= \frac{3^3}{4^3}$$

$$= \frac{3 \cdot 3 \cdot 3}{4 \cdot 4 \cdot 4} = \frac{27}{64}$$

Problem 2. (3.3 points) Solve for x, $16^{2x+1} = 2^{4x}$.

$16 = 2 \cdot 8 = 2 \cdot 2 \cdot 4 = 2 \cdot 2 \cdot 2 \cdot 2$

$$16^{2x+1} = 2^{4x}$$

$$(2^4)^{2x+1} = 2^{4x}$$

$(a^x)^b = a^{x \cdot b}$

$$2^{4(2x+1)} = 2^{4x}$$

when $a^n = a^m$ then $n = m$

$$4(2x+1) = 4x$$

$$8x + 4 = 4x$$

$$8x - 4x + 4 = 0$$

Solve for x

$$4x + 4 = 0$$

$$\frac{4x}{4} = \frac{-4}{4}$$

$$x = -1$$

Problem 3. (3.3 points) Solve for x, $\log_2(x+4) = \log_2(3x-2) - 1$

move every thing that has log/ln to one side and leave the numbers "-1" on the other

$$\log_2(x+4) - \log_2(3x-2) = -1$$

$$\log_b(M) - \log_b(N) = \log_b\left(\frac{M}{N}\right)$$

$$\log_2\left(\frac{x+4}{3x-2}\right) = -1$$

raise 2 to the power of and

$$2^{\log_2\left(\frac{x+4}{3x-2}\right)} = 2^{-1}$$

cross multiply

$$\frac{x+4}{3x-2} = \frac{1}{2}$$

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

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

$-2x \quad -2x$

$$8 = x-2$$

$+2 \quad +2$

$$10 = x$$

Problem 4. (0.1 point) What year am I dropping my mixtape?

mmh....