HAT
Advanced Logarithmic Thinking!

12/4/17

Warm Up: Solve

1) $\log_3 x + \log_3(x-8) = 2$

$\frac{\log_3(x^2-8x)}{3} = 3^2$

$x^2 - 8x = 9$

$x^2 - 8x - 9 = 0 \quad (x-9)(x+1) = 0$

$\boxed{x = 9}$

~~$x = -1$~~

2) $\dfrac{3\log_4 6x}{3} = \dfrac{9}{3}$

$4^{\log_4 6x} = 4^3 \quad 64 = 6x$

$\boxed{x = 10\frac{2}{3}}$

Which student solved for x correctly in the following problem? $2 \log x = 4$

Alice	Bob	Carl	David

$2 \log x = 4$ $2 \log x = 4$ $2 \log x = 4$ $2 \log x = 4$

$\log x^2 = 4$ $\log x^2 = 4$ $\log x^2 = 4$ $\log x^2 = 4$

$x^2 = 4$ $x^2 = 4$ $x^2 = 10^4$ $x^2 = 10^4$

$x = 2$ $x = \pm 2$ $x^2 = 10000$ $x^2 = 10000$

$x = 100$ $x = 100$

Which student solved for x correctly in the following problem? $2 \log 3 + \log x = \log 36$

Astro

Bella

$2 \log 3 + \log x = \log 36$

$2 \log 3 + \log x = \log 36$

$\log 9 + \log x = \log 36$

$\log 9 + \log x = \log 36$

$\log 9x = \log 36$

$\log (9 + x) = \log 36$

$9x = 36$

$9 + x = 36$

$x = 4$

$x = 27$

Chu

Domingo

$2 \log 3 + \log x = \log 36$

$2 \log 3 + \log x = \log 36$

$2(\log 3 + \log x) = \log 36$

$2(\log 3 + \log x) = \log 36$

$2 \log 3x = \log 36$

$2 \log 3x = \log 36$

$\log 3x^2 = \log 36$

$\log (3x)^2 = \log 36$

$3x^2 = 36$

$9x^2 = 36$

$x^2 = 12$

$x^2 = 4$

$x = \sqrt{12}$

$x = 2$

Ex#1: Solve $4^{2x} - 7 \cdot 4^{x} + 12 = 0$

$w = 4^x$ $(4^x)^2$ $4^{2x} - 7 \cdot 4^x = -12$

$w^2 - 7w + 12 = 0$

$4 = 4^x$

$x = 1$

$(w-4)(w-3)$

$3 = 4^x$

$w = 4 \quad w = 3$

$\log 3 \quad \log 4$

$x = 0.792 X$