Bellwork Alg 2 Wednesday, March 25, 2020

1. Solve. Round to the nearest hundredth. $5^{3x} = 7^{x+3}$

2. Write the equation of the exponential function ($y = a \cdot b^x$) that passes through these two points: $(6, 464)$ & $(9, 3712)$

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ANSWERS

1. Solve. Round to the nearest hundredth. $5^{3x} = 7^{x+3}$

$\log 5^{3x} = \log 7^{x+3}$

$3x \log 5 = (x+3) \log 7$

$3x \log 5 = x \log 7 + 3 \log 7$

$-x \log 7 \quad -x \log 7$

$3x \log 5 - x \log 7 = 3 \log 7$

$x(3 \log 5 - \log 7) = 3 \log 7$

$\frac{x(3 \log 5 - \log 7)}{3 \log 5 - \log 7} = \frac{3 \log 7}{3 \log 5 - \log 7}$

$x = \frac{3 \log 7}{3 \log 5 - \log 7}$

$x = 2.03$

2. Write the equation of the exponential function ($y = a \cdot b^x$) that passes through these two points: (6,464) & (9,3712)

$464 = a \cdot b^6$

$a = \frac{464}{b^6}$

$3712 = a \cdot b^9$

$3712 = \frac{464}{b^6} \cdot b^9$

$\frac{3712}{464} = \frac{464 b^3}{464}$

$\sqrt[3]{8} = \sqrt[3]{b^3}$

$b = 2$

$a = \frac{464}{b^6} = \frac{464}{2^6}$

$a = 7.25$

$y = 7.25(2)^x$