

Solve each equation for x . The technique will be:

A) Take the log of both sides for the equation $2^{3x+1} = 5$

$$\begin{aligned}\ln(2^{3x+1}) &= \ln 5 \\(3x+1)\ln 2 &= \ln 5 \\(3x+1).6931 &= 1.6095 \\2.0794x + .6931 &= 1.6095 \\2.0794x &= .9164 \\x &= .4407\end{aligned}$$

B) Use properties of logs to combine, then exponentiate for $\log_2(x+2) = 3 - \log_2 4x$

$$\begin{aligned}\log_2(x+2) + \log_2 5 &= 3 \\ \log_2(x+2)5 &= 2^3 \\ 2^{\log_2(x+2)5} &= 2^3 \\ 5x+2 &= 8 \\ 5x &= 6 \\ x &= \frac{6}{5}\end{aligned}$$

1. $3^x = 7$

2. $5^{2x+7} = 41$

3. $2^{7x+1} = 5^{3x}$

4. $104.23 = 2^{2.35x}$

5. $\log_3(x - 8) = 2 - \log_3 x$

(HINT: Move the \log_3 expressions to one side, combine, then exponentiate both sides with base 3.)