

$$38. \begin{aligned} 2^{x+1} &= 5^{1-2x} \\ \log_2 2^{x+1} &= \log_2 5^{1-2x} \\ x+1 &= (1-2x) \log_2 5 \\ x+1 &= \log_2 5 - 2x \log_2 5 \\ x + 2x \log_2 5 &= \log_2 5 - 1 \\ x(1 + 2 \log_2 5) &= \log_2 5 - 1 \end{aligned}$$

$$x = \frac{\log_2 5 - 1}{1 + 2 \log_2 5}$$

or  $\log_5 2^{x+1} = \log_5 5^{1-2x}$

$$(x+1) \log_5 2 = 1-2x$$

$$x \log_5 2 + \log_5 2 = 1-2x$$

$$x \log_5 2 + 2x = 1 - \log_5 2$$

$$x(\log_5 2 + 2) = 1 - \log_5 2$$

$$x = \frac{1 - \log_5 2}{\log_5 2 + 2}$$

$$40. \begin{aligned} \left(\frac{4}{3}\right)^{1-x} &= 5^x \\ \log_5 \left(\frac{4}{3}\right)^{1-x} &= \log_5 5^x \\ (1-x) \log_5 \left(\frac{4}{3}\right) &= x \\ \log_5 \left(\frac{4}{3}\right) &= x + x \log_5 \frac{4}{3} \\ \log_5 \left(\frac{4}{3}\right) &= x(1 + \log_5 \left(\frac{4}{3}\right)) \\ x &= \frac{\log_5 \left(\frac{4}{3}\right)}{1 + \log_5 \left(\frac{4}{3}\right)} \end{aligned}$$

$$42. \begin{aligned} (-3)^{1+x} &= 1.7^{2x-1} \\ \log_{-3} (-3)^{1+x} &= \log_{-3} (1.7)^{2x-1} \\ (1+x) &= 2x \log_{-3} 1.7 - \log_{-3} 1.7 \\ 1 + \log_{-3} 1.7 &= x(2 \log_{-3} 1.7 - 1) \\ x &= \frac{1 + \log_{-3} 1.7}{2 \log_{-3} 1.7 - 1} \end{aligned}$$

$$44. \begin{aligned} e^{x+3} &= \pi^x \\ \ln e^{x+3} &= \ln \pi^x \\ x+3 &= x \ln \pi \\ x - x \ln \pi &= -3 \\ x &= \frac{-3}{1 - \ln \pi} \end{aligned}$$

$$46. \begin{aligned} .3(4^{.2x}) &= .2 \\ 4^{.2x} &= \frac{2}{3} \\ \log_4 4^{.2x} &= \log_4 \left(\frac{2}{3}\right) \\ .2x &= \log_4 \frac{2}{3} \end{aligned}$$

$$x = \frac{\log_4 \frac{2}{3}}{.2}$$