S80 Nr. 7

a) $2^x + 3 = 2^{x+1}$

$2^x + 3 = 2^x \cdot 2^1 \quad | -2^x$

$3 = 2^x \quad | \log$

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

$\log(3) = x \cdot \log(2)$

$\frac{\log(3)}{\log(2)} = x \approx 1{,}585$

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b.) $7 \cdot 2^x = 13 \cdot 3^x \quad \left| \cdot \frac{1}{7 \cdot 3^x} \right.$

$\frac{2^x}{3^x} = \frac{13}{7}$

$\left(\frac{2}{3}\right)^x = \frac{13}{7}$

$x \log\left(\frac{2}{3}\right) = \log\left(\frac{13}{7}\right) \Rightarrow x = \frac{\log\left(\frac{13}{7}\right)}{\log\left(\frac{2}{3}\right)} \approx -1{,}527$

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c) $2^x + 2^{x+1} + 2^{x+2} = 3^x + 3^{x+1} + 3^{x+2}$

$2^x + 2^x \cdot 2^1 + 2^x \cdot 2^2 = 3^x + 3^x \cdot 3^1 + 3^x \cdot 3^2$

$1 \cdot 2^x + 2 \cdot 2^x + 4\ 2^x = 1 \cdot 3^x + 3\ 3^x + 9\ 3^x$

$7\ 2^x = 13 \cdot 3^x \quad \left| \cdot \frac{1}{7 \cdot 3^x} \right.$

$\frac{2^x}{3^x} = \frac{13}{7}$

$\left(\frac{2}{3}\right)^x = \frac{13}{7}$

$x \log\left(\frac{2}{3}\right) = \log\left(\frac{13}{7}\right)$

$x = \frac{\log\left(\frac{13}{7}\right)}{\log\left(\frac{2}{3}\right)} \approx -1{,}527$