14.2 a) $5^x = \frac{1}{25} \Leftrightarrow 5^x = \frac{1}{5^2} = 5^{-2} \Leftrightarrow \underline{x = -2}$

b) $8^x = \frac{1}{16} \Leftrightarrow (2^3)^x = \frac{1}{2^4} \Leftrightarrow 2^{3x} = 2^{-4} \Leftrightarrow 3x = -4 \quad |:3$

$\Leftrightarrow \underline{x = -\frac{4}{3}}$

c) $\underbrace{9^x}_{>0 \text{ aina}} = -\frac{1}{81}$ ↯ $\underline{\text{ei ratk.}}$

14.4 a) $3^x - 6 = 0 \Leftrightarrow 3^x = 6 \Leftrightarrow x = \underline{\log_3 6 \approx 1{,}631} \quad \left(\frac{\lg 6}{\lg 3}\right)$

b) $90 = 120 - 7^x \Leftrightarrow 7^x = 30 \Leftrightarrow x = \underline{\log_7 30 \approx 1{,}748}$

14.10 $4 \cdot 18^x = 6 \cdot 9^x$

$\Leftrightarrow (4 \cdot 18^x) - (6 \cdot 9^x) = 0$

$\Leftrightarrow 2 \cdot 9^x \left(2 \cdot \frac{18^x}{9^x} - 3\right) = 0$

$\Leftrightarrow 2 = 0$ ↯ tai $\underbrace{9^x}_{>0} = 0$ ↯ tai $2 \cdot \frac{18^x}{9^x} - 3 = 0$

$\Leftrightarrow 2 \cdot \left(\frac{18}{9}\right)^x - 3 = 0$

$\Leftrightarrow 2^x = \frac{3}{2} \Leftrightarrow x = \log_2 \frac{3}{2} \approx \underline{0{,}585}$

⌈TAI: $4 \cdot 18^x = 6 \cdot 9^x \quad |:(9^x \cdot 4)$

$\Leftrightarrow \frac{18^x}{9^x} = \frac{6}{4} = \frac{3}{2} \Leftrightarrow \left(\frac{18}{9}\right)^x = \frac{3}{2} \Leftrightarrow 2^x = \frac{3}{2}$ ...

TAI: $4 \cdot 18^x = 6 \cdot 9^x$

$\Leftrightarrow 4 \cdot (2 \cdot 9)^x = 6 \cdot 9^x$

$\Leftrightarrow 4 \cdot 2^x \cdot 9^x = 6 \cdot 9^x \quad |:(9^x \cdot 4)$

$\Leftrightarrow 2^x = \frac{6}{4} = \frac{3}{2}$ ... ⌋

14.15 $5^n + 5^n + 5^n + 5^n + 5^n = 5^{25}$

Ann. $t = 5^n$: $t + t + t + t + t = 5^{25}$

$\Leftrightarrow 5t = 5^{25} \quad |:5 \Leftrightarrow t = \frac{5^{25}}{5} = 5^{25-1} = 5^{24}$

$\Rightarrow 5^n = 5^{24} \Leftrightarrow \underline{n = 24}$

⌈TAI: $5^n + 5^n + 5^n + 5^n + 5^n = 5^{25} \Leftrightarrow 5 \cdot 5^n = 5^{25}$

$\Leftrightarrow 5^{1+n} = 5^{25} \Leftrightarrow 1 + n = 25$

$\Leftrightarrow n = 24$ ⌋