

Ex suppl.

$$a) (3^{x-1})^3 = 9 \cdot 3^{x-2}$$

$$3^{3x-3} = 3^2 \cdot 3^{x-2}$$

$$3^{3x-3} = 3^x$$

$$3x-3 = x$$

$$2x = 3$$

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

$$S = \left\{ \frac{3}{2} \right\}$$

$$b) 3^{4x} = 9^{x+5}$$

$$3^{4x} = (3^2)^{x+5}$$

$$3^{4x} = 3^{2x+10}$$

$$4x = 2x+10$$

$$2x = 10$$

$$x = 5$$

$$\Rightarrow S = \{5\}$$

$$c) \quad 5^{x+2} \cdot 25^{-x} = 625$$

$$5^{x+2} \cdot (5^2)^{-x} = 5^4$$

$$5^{x+2} \cdot 5^{-2x} = 5^4$$

$$5^{-x+2} = 5^4$$

$$-x+2 = 4$$

$$-2 = x$$

$$\Rightarrow S = \{-2\}$$

$$d) \quad 4^{x+2} - 8^x = 0$$

$$4^{x+2} = 8^x$$

$$(2^2)^{x+2} = (2^3)^x$$

$$2^{2x+4} = 2^{3x}$$

$$2x+4 = 3x$$

$$4 = x$$

$$\Rightarrow S = \{4\}$$

$$\left(\begin{array}{l} 2^{2x+4} - 2^{3x} = 0 \\ \downarrow \\ 2x+4 - 3x = 0 \end{array} \right)$$

$$e) 0,1^x = 1000$$

$$(10^{-1})^x = 10^3$$

$$10^{-x} = 10^3$$

$$-x = 3$$

$$x = -3$$

$$S = \{-3\}$$

$$10^{-1} = \frac{1}{10^1} = \frac{1}{10}$$

$$f) 5^{\frac{6}{x}} = 5^{x-1}$$

$$\frac{6}{x} = x-1 \quad | \cdot x$$

$$6 = x(x-1)$$

$$6 = x^2 - x$$

$$0 = x^2 - x - 6$$

$$(x-3)(x+2) = 0$$

$$\begin{array}{cc} \downarrow & \downarrow \\ 3 & -2 \end{array}$$

$$\Rightarrow S = \{-2, 3\}$$