

a) $9^{2x} = 27$ b) $\left(\frac{1}{2}\right)^{x-5} = 16$ c) $4^{x+3} = 8^{-x}$ d) $5^{2x-1} = 125$ e) $\left(\frac{1}{25}\right)^x = 5^3$
 $x = 3/4$ $x = 1$ $x = -6/5$ $x = 2$ $x = -3/2$

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

$$(2^{-1})^{x-5} = 2^4$$

$$5^{2x-1} = 5^3$$

$$(5^{-2})^x = 5^3$$

$$(3)^{4x} = 3^3$$

$$4x = 3$$

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

$$5^{-2x} = 5^3$$

$$(2)^{2x+6} = (2)^{-3x}$$

$$f) \left(\frac{2}{3}\right)^{2x+1} = \left(\frac{3}{2}\right)^{x+5}$$

$$x = -2$$

$$g) \left(\frac{2}{7}\right)^{2-x} = \left(\frac{49}{4}\right)^2$$

$$x = 6$$

$$h) \left(\frac{9}{16}\right)^{x-3} = \frac{4}{3}$$

$$x = 5/2$$

$$\left(\frac{2}{3}\right)^{2x+1} = \left(\frac{2}{3}\right)^{-x-5}$$

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

$$\left(\frac{3^2}{4^2}\right)^{x-3} = \frac{4}{3}$$

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

$$\left(\frac{3}{4}\right)^{2x-6} = \left(\frac{3}{4}\right)^{-1}$$

$$\left(\frac{2}{7}\right)^{2-x} = \left(\frac{7}{2}\right)^4$$

$$\left(\frac{2}{7}\right)^{2-x} = \left(\frac{2}{7}\right)^{-4}$$

$$\text{i) } 6 \cdot 2^{x+2} - 130 = 62$$

$$x = 3$$

$$\text{j) } 4 \cdot \left(\frac{1}{3}\right)^{1-x} + 12 = 48$$

$$x = 3$$

$$\text{k) } 34 = 10 \cdot \left(\frac{1}{2}\right)^{x-4} - 6$$

$$x = 2$$

$$6(2)^{x+2} = 192$$

$$(2)^{x+2} = 32$$

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

$$4\left(\frac{1}{3}\right)^{1-x} = 36$$

$$\left(\frac{1}{3}\right)^{1-x} = 9$$

$$(3)^{x-1} = 3^2$$

$$40 = 10\left(\frac{1}{2}\right)^{x-4}$$

$$\left(\frac{1}{2}\right)^{x-4} = 4$$

$$(2)^{4-x} = 2^2$$

$$l) 30 \cdot 5^{-x+2} - 6 = 0$$
$$x = 3$$

$$m) 0 = 5 - 245 \cdot 7^{x/3}$$
$$x = -6$$

$$n) 3^x = 27\sqrt{3} \quad x = 7/2$$

$$30(5)^{-x+2} = 6$$

$$(5)^{-x+2} = \frac{1}{5}$$

$$(5)^{-x+2} = 5^{-1}$$

$$245(7)^{\frac{x}{3}} = 5$$

$$(7)^{\frac{x}{3}} = \frac{1}{49}$$

$$(7)^{\frac{x}{3}} = 7^{-2}$$

$$3^x = 3^3 \times 3^{\frac{1}{2}}$$

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

$$o) \left(\frac{1}{9}\right)^{x+2} = 3\sqrt{3}$$

$x = -11/4$

$$p) 5^{-x} = 5\sqrt[3]{5}$$

$x = -4/3$

$$q) 2^{-3x} = \frac{\sqrt{2}}{8}$$

$x = 5/6$

$$r) 3^{2x+3} \cdot 9^x = 81^{1-x}$$

$x = 1/8$

$$(3^{-2})^{x+2} = 3 \times 3^{\frac{1}{2}}$$

$$5^{-x} = 5 \times 5^{\frac{1}{3}}$$

$$2^{-3x} = 2^{\frac{1}{2}} \times 2^{-3}$$

$$(3)^{-2x-4} = 3^{\frac{3}{2}}$$

$$5^{-x} = 5^{\frac{4}{3}}$$

$$2^{-3x} = 2^{\frac{-5}{2}}$$

$$-2x - 4 = \frac{3}{2}$$

$$(3)^{2x+3} \times (3^2)^x = (3^4)^{1-x}$$

$$-2x = \frac{11}{2}$$

$$3^{4x+3} = (3)^{4-4x}$$

$$4x + 3 = 4 - 4x$$

$$8x = 1$$

$$\text{s) } \frac{4^{3+x}}{2^x} = \frac{1}{8^x}$$

$x = -3 \mid :2$

$$\text{t) } \frac{9^x}{2^{2x}} = \frac{4}{9}$$

$x = -1$

$$\text{u) } 5^{2x-1} \cdot 5^{x+3} = 1$$

$x = -2 \mid :3$

$$\text{v) } \frac{27^x}{243} = 9^x \cdot 3^{-x}$$

$x = 5 \mid :2$

$$\frac{(2^2)^{3+x}}{2^x} = 2^{-3x}$$

$$(2)^{6+2x} (2)^{-x} = 2^{-3x}$$

$$(2)^{6+x} = 2^{-3x}$$

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

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

$$5^{3x+2} = 5^0$$

$$\frac{3^{3x}}{3^5} = 3^{2x} \times 3^{-x}$$

$$(3)^{3x} (3)^{-5} = 3^x$$

$$3^{3x-5} = 3^x$$

$$w) 8^{x-1} \cdot \frac{1}{4} \cdot 2^{x+1} = 16^{-1}$$

$$x = 0$$

$$x) (27^x)^{-2} = (9^{x+1})^2$$

$$x = -2/5$$

$$y) (4^{x/3})^2 \cdot \frac{1}{\sqrt{8^x}} = 16$$

$$x = -24$$

$$z) 5^{x+3} \cdot 5^{x-1} = \frac{1}{25} \quad x = -2$$

$$(2^3)^{x-1} \times 2^{-2} \times 2^{x+1} = (2^4)^{-1}$$

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

$$(2)^{3x-3} \times 2^{-2} \times 2^{x+1} = (2)^{-4}$$

$$(3)^{-6x} = (3)^{4x+4}$$

$$((2^2)^{\frac{x}{3}})^2 \cdot \frac{1}{(2^3)^{\frac{x}{2}}} = 2^4$$

$$(2)^{4x-4} = (2)^{-4}$$

$$(2)^{\frac{4x}{3}} (2)^{-\frac{3x}{2}} = 2^4$$

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

$$(2)^{\frac{4x}{3} - \frac{3x}{2}} = 2^4$$

$$(2)^{\frac{8x}{6} - \frac{9x}{6}} = 2^4$$

$$-\frac{x}{6} = 4$$

Un peu plus !

$$\text{a) } 4^x \cdot \sqrt{2} \cdot \left(\frac{1}{2^{-1}}\right)^2 = 2^{x+1}$$

$$x = -3/2$$

$$\text{b) } (3^{-2})^{x+1} \cdot \frac{1}{9^x} = \frac{1}{81}$$

$$x = 1/2$$

$$\text{c) } \sqrt[3]{7^x} \cdot \frac{1}{7} = 343 \cdot 7^x$$

$$x = -6$$

$$(2)^{2x} (2)^{\frac{1}{2}} (2)^2 = (2)^{x+1}$$

$$(2)^{2x + \frac{5}{2}} = (2)^{x+1}$$

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

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

$$x = \frac{2}{2} - \frac{5}{2}$$

$$(3)^{-2x-2} (3)^{-2x} = (3)^{-4}$$

$$(3)^{-4x-2} = (3)^{-4}$$

$$-4x - 2 = -4$$

$$-4x = -2$$

$$(7)^{\frac{x}{3}} (7)^{-1} = (7)^3 (7)^x$$

$$(7)^{\frac{x}{3}-1} = (7)^{x+3}$$

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

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

$$-\frac{2x}{3} = 4$$

$$\text{g) } 2^{x+3} + 5 \cdot 2^{x+1} = 9 \quad \text{h) } 5^{x-1} + 2 \cdot 5^x + 320 = 3 \cdot 5^{x+1} \quad \text{i) } 5 \cdot 2^{x+2} - 3 \cdot 2^{x-1} - 6 \cdot 2^{x+1} = \frac{13}{8}$$

$$\lambda = -1$$

$$\lambda = 2$$

$$\lambda = -2$$

$$(2)^{x+3} + 5(2)^{x+1} = 9$$

$$(5)^{x-1} + 2(5)^x + 320 = 3(5)^{x+1}$$