

ExpLog

$$\log_2 u = x \iff 2^x = u$$

$$\log u = \log_{10} u$$

$$\ln u = \log_e u$$

$$e \approx 2.718281 \dots$$

$$\log_2 (x \cdot y) = \log_2 (x) + \log_2 (y)$$

$$\log_2 (x^s) = s \cdot \log_2 (x)$$

$$\log_2 b = \frac{\log_c b}{\log_c 2}$$

plus aide-mémoire

$$\log_2 2 = 1$$

$$\log_2 1 = 0$$

1.2.1 2¹ 1.2.6

$$2^{f(x)} = 2^{g(x)} \iff f(x) = g(x)$$

$$\log 16 + 2 \log 3 - 2 \log 2 - \frac{1}{2} \log 9 =$$

$$\log 2^4 - 2 \log 2 + 2 \log 3 - \frac{1}{2} \log 3^2 =$$

$$\underbrace{4 \log 2 - 2 \log 2}_{2 \log 2} + \underbrace{2 \log 3 - \frac{1}{2} \cdot 2 \log 3}_{\log 3} = 2 \log 2 + \log 3$$

(Note: In the original image, the term $\log 3$ in the final result is circled in green.)

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

$$\frac{1}{2^n} = 2^{-n}$$

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

$$(2^n)^m = 2^{n \cdot m}$$

$$4^{(-1 \cdot f(x))} = 4^{-1}$$

\Rightarrow

$$4^{-f(x)} = 4^{-1}$$

$$(-1) \cdot f(x) = -f(x)$$

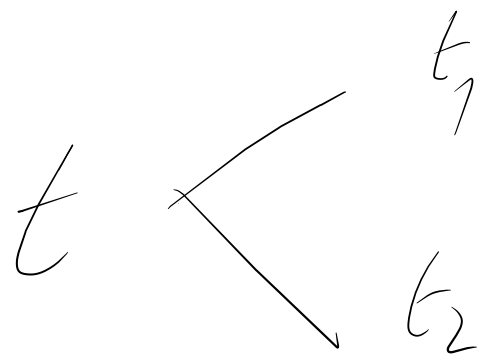
$$\frac{a}{b} + \frac{c}{d} = \frac{a \cdot d + b \cdot c}{b \cdot d}$$

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

$$2. \quad (3^{2x+1})^2 + 6 \cdot 3^{2x+1} + C = 0$$

$$2t^2 + 6t + C = 0$$

$$3^{2x+1} = t_1$$



$$3^{2x+1} = t_2$$

$$3^{4x+2} - 36 \cdot 3^{2x+1} + 243 = 0$$

$$\left(3^{2x+1}\right)^2 - 36 \cdot 3^{2x+1} + 243 = 0$$

$$(2^n)^m = 2^{n \cdot m}$$

$$t^2 - 36t + 243 = 0$$

$$\left(3^{2x+1}\right)^2 = 3^{2 \cdot (2x+1)}$$

$$(t - 9)(t - 27) = 0$$

$$t_1 = 9 \Rightarrow 3^{2x+1} = 9 \Leftrightarrow 2x+1 = 2 \Leftrightarrow x = \frac{1}{2}$$

$$t_2 = 27 \Rightarrow 3^{2x+1} = 27 \Leftrightarrow 2x+1 = 3 \Leftrightarrow x = 1$$

$$\textcircled{27}^{(x-1)} = \left(3^3\right)^{x-1}$$

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

