

FUNZIONE LOGARITMICA

1 Costruire per punti i grafici delle seguenti funzioni:

$$y = \log(x+3) \quad y = \frac{1}{\log x} \quad y = \log(x+1) + 1 \quad y = \log \sqrt{x+3}$$

2 Trovare i valori di x che soddisfano le seguenti uguaglianze:

$$\log_{\frac{2}{3}} \frac{4}{9} = x \quad \log_8 4 = x \quad \log_{36} 6 = x \quad \log_5 \sqrt[3]{25} = x \quad \log_{27} \sqrt[4]{3} = x$$

$$\log_2 x = 4 \quad \log_{\frac{3}{2}} x = -2 \quad \log_3 x = -\frac{1}{2} \quad \log_{\sqrt{2}} x = \frac{2}{3} \quad \log_5 x = -\frac{1}{3}$$

$$\log_x 16 = 8 \quad \log_x \frac{1}{9} = -4 \quad \log_x 196 = -2 \quad \log_x 16 = -4 \quad \log_x \sqrt[3]{16} = 2$$

PROPRIETÀ DEI LOGARITMI

3 Trasformare le seguenti espressioni in somme algebriche di logaritmi:

$$\log(3a\sqrt{b}) \quad \log\left(a\sqrt{b} \frac{\sqrt[3]{a^2 b}}{a+b}\right) \quad \log\left(2a^2 \sqrt{3a(a^2-b)}\right)$$

Ridurre a un unico logaritmo le seguenti espressioni:

$$4 \quad \log 6 - \frac{2}{3} \log 27 + \log 3 - 2 \log 2 \quad \left[\log \frac{1}{2} \right]$$

$$5 \quad \log a - 3 \log b + 2(\log a - \log b) \quad \left[\log \frac{a^3}{b^5} \right]$$

$$6 \quad 3\left(\log a - \frac{1}{2} \log b\right) + \frac{1}{2}(\log a - 2 \log b) \quad \left[\log \left(\frac{a^3}{b^2} \sqrt{\frac{a}{b}} \right) \right]$$

EQUAZIONI LOGARITMICHE

$$7 \quad 2 \log(x+3) = \log(x-1) + 4 \log 2 \quad [5]$$

$$8 \quad \frac{1}{2} \log(x^2-1) = -2 \quad [\pm \sqrt{1+10^{-4}}]$$

$$9 \quad \log x + \log(x-2) = \log(9-2x) \quad [3]$$

$$10 \quad \log_3(x^2+x) - \log_3(x^2-x) = 1 \quad [2]$$

$$11 \quad \log(10-2x) = \log(5-x) - \log 4 \quad [impossibile]$$

$$12 \quad \frac{1}{2} \log(x+20) = \log 2 + \frac{1}{4} \log(x+20) \quad [-4]$$

$$13 \quad \log x + \log(2x-1) = \log(2x+5) + \log 3 \quad [5]$$

$$14 \quad 2 \log x - \log(2x+1) + \log 3 = \log(x-2) \quad [impossibile]$$

$$15 \quad 2 \log x - \log(x-1) = 2 \log 2 \quad [2]$$

$$16 \quad \log_2 x - \log_2(x+4) + 1 = 0 \quad [4]$$

$$\boxed{17} \quad \log(2x+11) - \log(x+4) - \log 2 = \log(1-3x) - \log(1-x)$$

$$\left[-3, -\frac{1}{4}\right]$$

$$\boxed{18} \quad \log_2(3x+1) - \log_2(x+2) + 2 = \log_2(9x-4) - \log_2 x$$

$$\left[2, \frac{4}{3}\right]$$

$$\boxed{19} \quad \log x - \frac{1}{2} \log(x^2+1) = \log(4-x) - \frac{1}{2} \log(x^2-8x+17)$$

$$[2]$$

$$\boxed{20} \quad \frac{1}{2} \log_2 x + \log_4 x = 2$$

$$[4]$$