

S.4 Equations Pt. 2

① If $\log x = a$ and $\log y = b$, what is $\log \frac{x^3}{y^2}$ in terms of a and b ?

$$\log x^3 - \log y^2$$

$$3 \log x - 2 \log y$$

$$3a - 2b$$

② If $x = \log_4 5$ and $y = \log_4 3$, express $\log_4 225$ in terms of x and y .

* rewrite 225 in terms of 5, 3, or 4

$$\begin{array}{l} 225 \\ / \quad / \\ 5 \times 45 \\ / \quad / \quad / \\ 5 \times 5 \times 3 \times 3 \end{array} \quad \therefore \log_4 5^2 \cdot 3^2$$

$$\log_4 225 = \log_4 5^2 \cdot 3^2$$

$$\log_4 5^2 + \log_4 3^2$$

$$2\log_4 5 + 2\log_4 3$$

$$x = \log_4 5 \text{ and } y = \log_4 3$$

$$2x + 2y$$

③ If $x = \log_3 2$ and $y = \log_3 5$ express $\log_3 360$ in terms of x and y .

$$\log_3 360 = \log_3 2^3 \cdot 5 \cdot 3^2$$

$$= 3\log_3 2 + \log_3 5 + 2\log_3 3$$

$$= \boxed{3x + y + 2}$$

360

40 9

8 3 3

5

2 2 2

④ If $\log_9 S = x$ and $\log_{27} 2 = y$, express $\log_3 100$ in terms of x and y .

$$\log_{\sqrt{9}} S = x$$

$$\log_3 S^{\frac{1}{2}} = x$$

$$\frac{1}{2} \log_3 S = x$$

$$\log_3 S = 2x$$

$$\log_{\sqrt[3]{27}} 2 = y$$

$$\log_3 2^{\frac{1}{3}} = y$$

$$\frac{1}{3} \log_3 2 = y$$

$$\log_3 2 = 3y$$

$$100$$

$$11$$

$$25 \cdot 4$$

$$11 \cdot 11$$

$$5 \cdot 5 \cdot 2 \cdot 2$$

$$\log_3 S^2 \cdot 2^2$$

$$\log_3 S^2 + \log_3 2^2$$

$$2 \log_3 S + 2 \log_3 2$$

$$2[2x] + 2[3y]$$

$$4x + 6y$$

⑤ Solve

$$\log_2(\log_x(\log_3(27))) = -1$$

$$\log_2(\log_x 3) = -1$$

$$2^{-1} = \log_x 3$$

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

$$x = 9$$

R 228

2, 3, 5, 7

(a, c, e)