# Laws of Logarithms

1) $\log 1_a = 0$

2) $\log a_a = 1$

3) $\log a_a^{\,n} = n$

4) $a^{\log_a M} = M$

Product Law/ Quotient Law/ Power Law

5) $\log_a xy = \log_a x + \log_a y$

6) $\log_a \frac{x}{y} = \log_a x - \log_a y$

7) $\log_a x^n = n \log_a x$

# P176

Given

$\log_2 3 = 1.5850$

$\log_2 5 = 2.3219$

Q6:-

(f) $\log_2 \sqrt[3]{9}$

$\log_2 9^{1/3}$

$\frac{1}{3} \log_2 9$

$\frac{1}{3} \log_2 3 \cdot 3$

$\frac{1}{3} (\log_2 3 + \log_2 3)$

$\frac{1}{3} (1.585 + 1.585)$

$\frac{1}{3} (3.170)$

$= 1.0566\ldots$

Q7:-

(h). $\log_2\left(\frac{3^2 \times 7^3}{5^2}\right)$

$\log_2 3^2 + \log_2 7^3 - \log_2 5^2$

$2\log_2 3 + 3\log_2 7 - 2\log_2 5$

Q8(f)

$$3\log_5 2 + \log_5 3 - 2\log_5 7$$

$$\log_5 2^3 + \log_5 3 - \log_5 7^2$$

$$\log_5 \frac{2^3 \times 3}{7^2}$$

$$\log_5 \frac{8 \times 3}{49} = \log_5 \frac{24}{49}$$

P176 (finish)
Q 4—8

p173

Q 18(a)

$f(x) = 3^{x+1} - 6$

$y = 3^{x+1} - 6$

$y + 6 = 3^{x+1}$

$\log_3 y+6 = x+1$

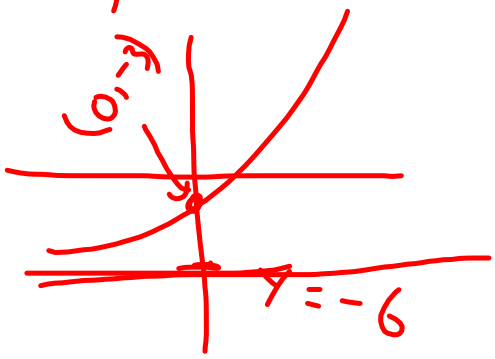
$\log_3(y+6) - 1 = x$

$y = \log_3(x+6) - 1$

$y = ac^x + k$

$y = 3^x \cdot 3^1 - 6$

$y = 3 \cdot 3^x - 6$




Range

$]-6, \infty[$

Domain

$\mathbb{R}$

Range : $\mathbb{R}$