Logarithms

Q. $\log(64) = 1.806$ then $\log(16) = ?$

→ $3\log(4) = 1.806$ $\log(16) \Rightarrow 2(\log(4)) = \frac{1.806 \times 2}{3}$

$= 1.204$

Q. If $\log 2 = 0.3010$ and $\log 3 = 0.4771$ then $\log_5 1024$?

→ $\frac{\log 1024}{\log 5} \Rightarrow \frac{\log 2^{10}}{\log 10 - \log 2} \Rightarrow \frac{10 \times 0.3010}{1 - 0.3010}$

$= \frac{3.010}{0.699} = 4.31$

Q. $\log 2 = 0.30103$ & $\log 3 = 0.4771$ find digit in $(648)^5$

→

$\log(648)^5 \Rightarrow 5[\log(81) + \log(8)]$

$= 5[4\log(3) + 3\log(2)]$

$= 20 \times 0.4771 + 15 \times 0.30103$

$= 14.05 \approx 14$

No. of digits in no are $14 + 1 = 15$

(15)

Q. $\log_x\left(\frac{9}{4}\right) = \frac{-1}{2}$ then $x = ?$

→ $\frac{9}{4} = x^{(-1/2)} \Rightarrow \frac{9}{4} = \frac{1}{\sqrt{x}} \Rightarrow \boxed{x = \frac{16}{81}}$

Q. $\log_2(512) = ?$

→ $\log_2 2^9 = 9\ (1)$

Q. if $\log_{10} 2 = 0.3010$ what is value of $\log_{10} 1600$?

→ $= \log_{10} 16 + \log_{10} 100$

$= 4 \log_{10} 2 + 2 \log_{10} 10$

$= 4 \times 0.3010 + 2$

$= 3.204$

Q. $\frac{1}{\log_2 48} + \frac{1}{\log_4 48} + \frac{1}{\log_6 48} = ?$

→ $\frac{1}{\frac{\log 48}{\log 2}} + \frac{1}{\frac{\log 48}{\log 4}} + \frac{1}{\frac{\log 48}{\log 6}} = \frac{\log 2}{\log 48} + \frac{\log 4}{\log 48} + \frac{\log 6}{\log 4}$

$= \log_{48}(2 \times 4 \times 6)$

$= 1$

Q. $\log_{10} 5 + \log_{10}(5x+1) = \log_{10}(x+5) + 1$

→ $\log 5(5x+1) = \log(x+5) + \log_{10} 10$

$25x + 5 = 10x + 50$

$\boxed{x = 3}$

Q. $\log_{(0.001)}(100) = ?$

$\log_{0.001}(100) = P$

$2\log(10) = P.\log(0.001)$

$2\log(10) = P.\log\left(\frac{1}{1000}\right)$

$2\log(10) = -3P\log(10)$

$\boxed{P = \frac{-2}{3}}$

Q. $\log_2[\log_3(\log_2 x)] = 1$

$= 512$

Q. $(\log_3 4)(\log_4 5)(\log_5 6)(\log_6 7)(\log_7 8)(\log_8 9)(\log_9 9) = ?$

$= \frac{\log 9}{\log 3} = \frac{2\log 3}{\log 3} = 2$

$\boxed{= 2}$

Q. $\log_{(-2)}(-2)$ = not defined.

Q. No. of digits in 2^{64}, $\log 2 = 0.3010$

→ $\log 2^{64} \Rightarrow 64\log(2) = 19$

No. of digits $= 19 + 1 = 20$

$\boxed{20}$

Q.