

BASIC LOG WORK : ANSWERS

1) a) $10^3 = 1000$

$\log_{10} 1000 = 3$

b) $2^3 = 8$

$\log_2 8 = 3$

c) $5^2 = 25$

$\log_5 25 = 2$

d) $10^{-2} = 0.01$

$\log_{10} 0.01 = -2$

e) $a^m = n$

$\log_a n = m$

f) $x^y = z$

$\log_x z = y$

2) a) $\log_{10} 100 = 2$

$10^2 = 100$

b) $\log_{10} 0.1 = -1$

$10^{-1} = 0.1$

c) $\log_{10} 0.001 = -3$

$10^{-3} = 0.001$

d) $\log_2 32 = 5$

$2^5 = 32$

e) $\log_a x = y$

$a^y = x$

f) $\log_p q = z$

$p^z = q$

3) a) Let $x = \log_{10} 10000$

$10^x = 10000$

$x = 4$

$\therefore \log_{10} 10000 = 4$

b) Let $x = \log_2 16$

$2^x = 16$

$x = 4$

$\therefore \log_2 16 = 4$

c) $\log_3 3$

$= 1$

$\star \log_a a = 1$
always!

d) $\log_a 1$

$= 0$

$\log 1 = 0$
always for any
base

Let
e) $x = \log_4 16$

$4^x = 16$

$x = 2$

$\therefore \log_4 16 = 2$

f) Let $x = \log_5 125$

$5^x = 125$

$x = 3$

$\therefore \log_5 125 = 3$

$$4) \quad a) \quad \log_x 125 = 3$$

$$x^3 = 125$$

$$x = 5$$

↳

$$b) \quad \log_x 16 = 2$$

$$x^2 = 16$$

$$x = \pm 4$$

↑

you can have
negative base!

$$c) \quad \log_x 1000\,000 = 6$$

$$x^6 = 1000\,000$$

$$x = \pm 10$$

$$d) \quad \log_x 81 = 4$$

$$x^4 = 81$$

$$x = \pm 3$$