Exercise 2.2

Q1:- Express each of the following in logarithmic form.

i):- $10^{3} = 1000$

$\log_{10} 1000 = 3$

ii):- $2^{8} = 256$

$\log_{2} 256 = 8$

iii):- $3^{-3} = \frac{1}{27}$

$\log_{3} \frac{1}{27} = -3$

iv):- $20^{2} = 400$

$\log_{20} 400 = 2$

Exponential

$a^{y} = x$

logarithmic

$\log_{a} x = y$

v):- $16^{-\frac{1}{4}} = \frac{1}{2}$

$\log_{16} \frac{1}{2} = -\frac{1}{4}$

vi):- $11^{2} = 121$

$\log_{11} 121 = 2$

vii):- $q^{r} = p$

$\log_{q} p = r$

viii):- $(32)^{-\frac{1}{5}} = \frac{1}{2}$

$\log_{32} \frac{1}{2} = -\frac{1}{5}$

Q2:- Express each of the following in exponential form.

i):- $\log_5 125 = 3$

$5^3 = 125$

ii):- $\log_2 16 = 4$

$2^4 = 16$

iii):- $\log_{23} 1 = 0$

$23^0 = 1$

iv):- $\log_5 5 = 1$

$5^1 = 5$

$\log_a x = y$

$a^y = x$

v):- $\log_2 \frac{1}{8} = -3$

$2^{-3} = \frac{1}{8}$

vi):- $\log_9 3 = \frac{1}{2}$

$9^{\frac{1}{2}} = 3$

vii):- $\log_{10} 100000 = 5$

$10^5 = 100000$

viii):- $\log_4 \frac{1}{16} = -2$

$4^{-2} = \frac{1}{16}$

Q3:- Find the values of x in each of the following.

i):- $\log_x 64 = 3$

$x^3 = 64$

$x^3 = (4)^3$

$x = 4$

ii):- $\log_5 1 = x$

$5^x = 1$

$5^x = 5^0$

$x = 0$

iii):- $\log_x 8 = 1$

$x^1 = 8$

$x = 8$

iv):- $\log_{10} x = -3$

$10^{-3} = x$

$\frac{1}{10^3} = x$

$\frac{1}{1000} = x$

$x = \frac{1}{1000} = 0.001$

v):- $\log_4 x = \frac{3}{2}$

$4^{\frac{3}{2}} = x$

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

$2 \times \frac{3}{2}$

$(2) = x$

$(2)^3 = x$

$8 = x$

$x = 8$

vi):- $\log_2 1024 = x$

$2^x = 1024$

$2^x = 2^{10}$

$x = 10$