

Unit 2

Ex 2.2

Q1 Check whether  $\log_x(7-x)$  is defined for:

i)  $x = 0$

$$\log_x(7-x) = y$$

$$7-x = x^y$$

$$7-0 = (0)^y$$

$$7 = (0)^y$$

it's not defined

ii)  $\log_x(7-x) = y$

$$7-1 = (1)^y$$

$$6 = 1^y$$

it's not defined

iii)  $7-x = x^y$

$$7-6 = 6^y$$

$$1 = 1$$

it is defined if  $y=0$

iv)  $7-x = x^y$

$$7-7 = (7)^y$$

$$0 = (7)^y$$

it's not defined

Q2 Convert the form of following equations i.e. from exponential from to logarithmic form and vice versa?

i)  $\log_6 216 = 3$

$\Rightarrow 216 = 6^3$

$216 = 216$  Ans.

ii)  $7^4 = 2401$

~~$\Rightarrow \log_7 2401 = 4$~~

$7^4 = 7^4$  Ans.

iii)  $\log_5 x = 5$

$x = (5)^5$  Ans.

iv)  $125^{\frac{x}{3}} = 25$

$\log_{125} 25 = \frac{x}{3}$  Ans.

v)  $b^{\frac{3}{4}} = \frac{1}{27}$

$\log_b \frac{1}{27} = \frac{-3}{4}$  Ans.

vi)  $\log_{10} 10^{12} = y$

$\Rightarrow 10^{12} = 10^y$  Ans.

vii)  $(256)^{\frac{x}{4}} = \frac{1}{64}$

$\log_{256} \frac{1}{64} = \frac{x}{4}$  Ans.

viii)  $\log_3 (x^3 + 1) = 2$

$(x^3 + 1) = 3^2$  Ans.

ix)  $\log_5 (2x - 3) = 1$

$\Rightarrow 2x - 3 = (5)^1$  Ans.

x)  $2 + 1 = 2^3$

$\log_2 2 + 1 = 3$  Ans.

Q3 find the value of x in the following question.

i)  $\log_x 3 = 1$

$$3 = (x)^1$$

$$x = 3 \text{ Ans.}$$

ii)  $\log_2 64 = x+1$

$$64 = 2^{(x+1)}$$

$$2^6 = 2^{(x+1)}$$

$$6 = x+1$$

$$6-1 = x$$

$$5 = x$$

$$x = 5 \text{ Ans.}$$

iii)  $\log_{x+1} 9 = 2$

$$9 = (x+1)^2$$

$$\sqrt{9} = \sqrt{(x+1)^2}$$

$$3-1 = x \quad \sqrt{9} = (x+1)^2$$

$$2 = x$$

$$x = 2 \text{ Ans.}$$

iv)  $\log_2 x = 4$

$$x = 2^4$$

$$x = 16 \text{ Ans.}$$

v)  $\log_3 81 = x$

$$81 = 3^x$$

$$3^{24} = 3^x$$

$$x = 24 \text{ Ans.}$$

vi)  $\log_2 (x^2-1) = 3$

$$(x^2-1) = 2^3$$

$$x^2-1 = 8$$

$$x^2 = 8+1$$

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

$$x = 3 \text{ Ans.}$$

Q4 Find the unknowns appeared in the question 2.

iii)  $\log_5 x = 5$

$x = 5^5$

$x = 3,125$  Ans -

v)  $125^{\frac{x}{3}} = 25$

$(5)^{\frac{3x}{3}} = (5)^2$

$5^x = 5^2$

$x = 2$  Ans -

vii)  $\log_3 (x^3 + 1) = 2$

$(x^3 + 1) = 3^2$

$x^3 = 9 - 1$

$x^3 = 8$

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

$x = 2$  Ans -

vii)  $\log_{10} 10^{12} = y$

$10^{12} = 10^y$

$12 = y$

or.

$y = 12$  Ans -

ix)  $\log_5 (2x - 3) = 1$

$(2x - 3) = (5)^1$

$2x = 5 + 3$

$2x = 8$

$x = \frac{8}{2}$

$x = 4$  Ans

vii)  $(256)^{\frac{x}{4}} = \frac{1}{64}$

$(2)^{\frac{2x}{4}} = \frac{1}{(2)^6}$

$2^{2x} = (2)^{-6}$

$2x = -6$

~~$x = \frac{-6}{2}$~~

$x = -3$  Ans -

x)  $2x + 1 = 2^3$

$2x = 8 - 1$

$x = \frac{7}{2}$

$x = 3.50$  Ans -