

Unit 2

Ex 2.2

Q2 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) $7-x = x^y$

$$7-6 = 6^y$$

$$1 = 1$$

it is defined if $y=0$

iii) $7-x = x^y$

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

$$0 = (7)^y$$

it's not defined

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

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

$$6 = 1^y$$

it's not defined

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

i) $\log_6 216 = 3$

$\bullet 216 = 6^3$

$216 = 216$ Ans

ii) $7^4 = 2401$

$\bullet \log_7 2401 = 4$

$7^4 = 7^4$ Ans

iii) $\log_5 x = 5$

$x = (5)^5$ Ans

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

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

v) $6^{\frac{-3}{4}} = \frac{1}{27}$

$\log_6 \frac{1}{27} = \frac{-3}{4}$ Ans

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

$\bullet 10^{12} = 10^y$ 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) $\log_5 (2x - 3) = 1$

$\bullet 2x - 3 = (5)^1$ 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) $\log_{x+1} 9 = 2$

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

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

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

$$8 = x^2 \quad 3 = x + 1$$

$$3 - 1 = x$$

$$2 = x$$

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

iv) $\log_2 x = 4$

$$x = 2^4$$

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

v) $\log_3 81 = x$

$$81 = 3^x$$

$$3^4 = 3^x$$

$$x = 4 \text{ Ans}$$

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.

$$\text{iii) } \log_5 x = 5$$

$$x = 5^5$$

$$x = 3,125 \text{ Ans}$$

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

$$10^{12} = 10^y$$

$$12 = y$$

$$y = 12 \text{ Ans}$$

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

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

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

$$2x = -6$$

$$x = \frac{-6}{2} = -3$$

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

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

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

$$5^x = 5^2$$

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

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

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

$$2x = 5+3$$

$$2x = 8$$

$$x = \frac{8}{2} = 4$$

$$x = 4 \text{ Ans}$$

$$\text{x) } 2x+1 = 2^3$$

$$2x = 8-1$$

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

$$x = 3.50 \text{ Ans}$$

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

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

$$x^3 = 9-1$$

$$x^3 = 8$$

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

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