

**Exercise 3.2****Q. 1: Find the common logarithm of each of the following numbers.**

- (i) 232.92  
232.92 can be rounded as 232.9  
The characteristic is 2 and the mantissa, using log tables, is .3672  
 $\log 232.92 = 2.3672$
- (ii) 29.326  
29.326 can be rounded as 29.33  
The characteristic is 1 and the mantissa, using log tables, is .4673  
 $\log 29.326 = 1.4673$
- (iii) 0.00032  
The characteristic is -4 and the mantissa, using log tables, is .5051  
 $\log 0.00032 = \bar{4}.5051$
- (iv) 0.3206  
The characteristic is -1 and the mantissa, using log tables, is .5059  
 $\log 0.3206 = \bar{1}.5059$

**Q. 2: If  $\log 31.09 = 1.4926$ , find values of the following**

- (i)  $\log 3.109$   
The characteristic is 0 and the mantissa is .4926  
 $\log 3.109 = 0.4926$
- (ii)  $\log 310.9$   
The characteristic is 2 and the mantissa is .4926  
 $\log 310.9 = 2.4926$
- (iii)  $\log 0.003109$   
The characteristic is -3 and the mantissa is .4926  
 $\log 0.003109 = \bar{3}.4926$
- (iv)  $\log 0.3109$   
The characteristic is -1 and the mantissa is .4926  
 $\log 0.3109 = \bar{1}.4926$

**Q. 3: Find the numbers whose common logarithms are (i) 3.5621      (ii)  $\bar{1}.7427$** 

- (i) 3.5621  
the value of .5621 in antilog table is 3649  
As characteristic is 3 so shifting point from reference point to 3 digits at right.  
 $\text{Antilog } 3.5621 = 3649$
- (ii)  $\bar{1}.7427$   
the value of .7427 in antilog table is 5530  
As characteristic is -1 so shifting point from reference point to 1 digit at left.  
 $\text{Antilog } \bar{1}.7427 = 0.5530$

**Q. 4: What replacement for the unknown in each of following will make the statement true?**

- (i)  $\log_3 81 = L$



$$81 = 3^L$$

$$3^4 = 3^L$$

$$L = 4$$

$$(ii) \log_a 6 = 0.5$$

$$6 = a^{0.5}$$

$$6^2 = (a^{0.5})^2$$

$$a = 36$$

$$(iii) \log_5 n = 2$$

$$n = 5^2$$

$$n = 25$$

$$(iv) 10^P = 40$$

$$P \log 10 = \log 40$$

$$P = 1.6021$$

**Q. 5: Evaluate (i)  $\log_2 \frac{1}{128}$  (ii)  $\log 512$  to the base  $2\sqrt{2}$**

$$(i) \text{ let } x = \log_2 \frac{1}{128}$$

$$2^x = \frac{1}{2^7}$$

$$2^x = 2^{-7}$$

$$x = -7$$

$$(ii) \text{ let } x = \log_{2\sqrt{2}} 512$$

$$(2\sqrt{2})^x = 512$$

$$(2\sqrt{2})^x = (2\sqrt{2})^6$$

$$x = 6$$

**Q. 6: Find the value of x from the following statements.**

$$(i) \log_2 x = 5$$

$$x = 2^5$$

$$x = 32$$

$$(ii) \log_{81} 9 = x$$

$$9 = 81^x$$

$$9^1 = 9^{2x}$$

$$2x = 1$$

$$x = \frac{1}{2}$$

$$(iii) \log_{64} 8 = \frac{x}{2}$$

$$8 = 64^{\frac{x}{2}}$$

$$8^1 = 8^{2 \times \frac{x}{2}}$$

$$8^1 = 8^x$$

$$x = 1$$

$$(iv) \log_x 64 = 2$$

$$64 = x^2$$



$$8^2 = x^2$$

$$x = 8$$

(v)  $\log_3 x = 4$

$$x = 3^4$$

$$x = 81$$

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