

Mon, June 29.

Chapter#03APPROXIMATION AND ESTIMATION

Approximation: قریب، لگ بھگ، تقریباً
 Estimation: اندازہ لگانا

Note: We use an approximate value because the actual value is not necessary.

Example #1:- Page # 60.

Round off each of the following numbers to the nearest 10.

(a) 275

(b) 273.1

(a) 275

	tens place	Unit Place
	↓	↓
2	7	5

= 2 8 0 Ans

(b) 273.1

	tense	Unit	
	↓	↓	
2	7	3	. 1

= 2 7 0 Ans.

Note: If digit after point (.) is less than five (5) and digit ~~on~~ before the point is also less than 5 then tense place would not be change.

Example # 02: page # 61.

Correct 96.482 to

(a) 1 decimal place

(b) the nearest whole number.

(a) 1 decimal place

$$\begin{array}{ccccccc} & & & & \downarrow & & \\ & & & & \text{1 decimal place} & & \\ 9 & 6 & . & 4 & 8 & 2 & \\ & & & & \downarrow & & \\ & & & & \text{greater than 5} & & \\ = & 9 & 6 & . & 5 & \text{Ans.} & \end{array}$$

(b) The nearest whole number. (without point)

$$\begin{array}{ccccccc} & & & & \downarrow & & \\ & & & & \text{less than 5} & & \\ 9 & 6 & . & 4 & 8 & 2 & \\ & & & & \downarrow & & \\ = & 9 & 6 & \text{Ans.} & & & \end{array}$$

Ex # 3A

BASIC LEVEL

1. Round off 698 352 to the nearest
(a) 100 (b) 1000 (c) 10 000.

(a) to the ~~100~~ nearest 100.

			Hund	tens	Unit
			↓	↓	↓
6	9	8	3	5	2

= 6 9 8 4 0 0 Ans.

(b) TO the nearest 1000.

		thous.	Hund	tens	Unit
		↓	↓	↓	↓
6	9	8	3	5	2

= 6 9 8 0 0 0 Ans.

(c) to the nearest 10 000.

	ten thou		thou	Hund	tens	Unit
	↓		↓	↓	↓	↓
6	9	8	3	5	2	

= ~~6~~ 7 0 0 0 0 0 Ans.

Q26 - Correct 45.7395 to

- (a) 1 decimal Place
- (b) the nearest whole number.
- (c) 3 decimal places.

(a) Correct 45.7395 to 1 decimal place.

1 decimal
↓ Place less than 5

4 5 . 7 3 9 5

= 45.7 Ans

(b) the nearest whole number. (without point)

equal to 5 greater than 5

↓ ↓

4 5 . 7 3 9 5

= 46 Ans

(c) Correct 45.7395 to 3 decimal places.

3 decimal place

↓ ↓ equal to 5

4 5 . 7 3 9 5

= 45.740 Ans

Pg 1
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Exercise # 3A

BASIC LEVEL

Q2:- Correct 45.7395

SIGNIFICANT DIGITS

↓
مهم، ضروری

Significant figures are used to reflect the degree of accuracy.

(1) Rule 1: All non-zero digits (other than zero) are significant.

Ex : 7258 has 4 significant figures.

(2) Rule 2: All zeros between non-zero digits are significant.

Ex : 32.047 has 5 significant digits.

(3) Rule 3: In a decimal, all zeros after a non-zero digit are significant.

Ex : 0.10 has 2 sig. digits.

0.500 has 3 sig. digits

41.0320 has 6 sig. digits.

6.090 has 4 sig. digits.

(4) Rule 4:- In a decimal, all zeros before a non-zero digit are ^{"NOT"} significant.

Ex: 0.021 has 2 sig. digits

0.603 has 3 sig. digits

0.00173 has 3 sig. digits.

0.1090 has 4 sig. digits.

(5) Rule 5:-

In whole numbers, the zeros at the end may or may not be significant. It depends on how the numbers are approximated.

Page # 3

Example # 4 : Page # 66.

Round off each of the following to the number of significant figures as given in brackets.

(a) 8982 (2 Significant figure (s.f))

Sol:-

$$\begin{array}{ccccccc} & & 2 \text{ s.f} & & \text{greater than} & & \\ & & 9 & & 8^5 & & 2 \\ & 8 & \underline{9} & & \underline{8} & & \\ = & 9 & 0 & & 0 & & 0 \text{ Ans} \end{array}$$

(b) 0.0060195 (4 Significant figure (s.f))

Non Significant
Rule # 4

$$\begin{array}{cccccccc} & & & & 4 \text{ s.f} & & \text{equal to} & \\ & & & & & & 5 & \\ \overline{0.0060195} & & & & & & & \\ = & 0.006020 & & & & & & \end{array}$$

(c) 0.9999 (3 Significant figure (s.f))

Not Significant
(Rule 4)

$$\begin{array}{ccccccc} & & & & 3 \text{ s.f} & & \text{greater than} \\ & & & & & & 5 \\ \text{⓪} \downarrow & \text{⓪} & \text{⓪} & & 9 & & 9 \\ 0. & 9 & 9 & & \underline{9} & & \underline{9} \\ & \text{⓪} & \text{⓪} & & \text{⓪} & & \\ \text{⓪} \rightarrow & 1.00 & & & \text{Ans} & & \end{array}$$

Practice Now 4:-

Round off each of the following to the number of significant figures as given in brackets.

(a) 3748 (3 s.f)

$$\begin{array}{cccc} & & 3 \text{ s.f} & \text{greater than } 5 \\ 3 & 7 & 4 & 8 \\ & & \underline{\quad} & \underline{\quad} \end{array}$$

= 3750 Ans

(b) 0.00470989 (4 s.f)

$$\begin{array}{ccccccc} & \text{not sig.} & & & 4 \text{ s.f} & \text{greater than } 5 \\ \hline 0 & . & 0 & 0 & 4 & 7 & 0 & 9 & 8 & 9 \\ & & & & & & \textcircled{0} & \underline{9} & \underline{8} & 9 \\ & & & & & & & 0 & & \end{array}$$

= 0.004710 Ans

(c) 4971 (2 s.f)

$$\begin{array}{cccc} \textcircled{1} & 2 \text{ s.f} & \text{greater than } 5 & \\ 4 & 9 & 7 & 1 \\ & \underline{9} & \underline{7} & \end{array}$$

= ~~49~~ 5000 Ans

BASIC LEVEL

1. State the number of significant figures in each of the following

(a) 39018

Number of significant digits are 5.

(b) 0.028030

Number of significant digits are 5.

(c) 2900 (to the nearest 10)

Number of significant figures are 3.

①

Exercise # 3B

wednesday.

Q2:- Round off each of the following to the number of significant figures as given in brackets.

(a) 728 (2 s.f)

= 7 $\overset{2 \text{ s.f}}{\underline{2}}$ $\overset{\text{greater than } 5}{\underline{8}}$

= 730 Ans.

(b) 503.88 (4 s.f)

= 5 0 3 . $\overset{4 \text{ s.f}}{\underline{8}}$ $\overset{\text{greater than } 5}{\underline{8}}$

= 503.9 Ans.

(c) 0.0030185 (4 s.f)

= 0 . 0 0 3 0 1 $\overset{4 \text{ s.f}}{\underline{8}}$ $\overset{\text{greater than } 5}{\underline{5}}$

= 0.003019 Ans.

(d) 6396 (2 s.f and 3 s.f)

2 s.f :-

= 6 $\overset{2 \text{ s.f}}{\underline{3}}$ $\overset{\text{greater than } 5}{\underline{9}}$ 6

= 6 4 0 0 Ans

3 s.f

6 $\overset{3 \text{ s.f}}{\underline{3}}$ $\overset{\text{greater than } 5}{\underline{9}}$ 6

= 6 4 0 0 Ans

(2)

$$(e) \quad 9.9999 \quad (3 \text{ s.f.})$$

$$= \overset{\textcircled{0}}{9} . \overset{\textcircled{0}}{9} \overset{\text{3 s.f.}}{\underset{\textcircled{0}}{9}} \overset{\text{greater than 5}}{\underset{\text{—}}{9}} 9$$

$$= 10.0 \quad \underline{\text{Ans}}$$

$$(f) \quad 8.076 \quad (3 \text{ s.f.})$$

$$= 8 . 0 \overset{\text{3 s.f.}}{\underset{\text{—}}{7}} \overset{\text{greater than 5}}{\underset{\text{—}}{6}}$$

$$= 8.08 \quad \underline{\text{Ans}}$$