

Tender Heart High School, Sec-33B, Chandigarh

Subject - Mathematics
Class - V

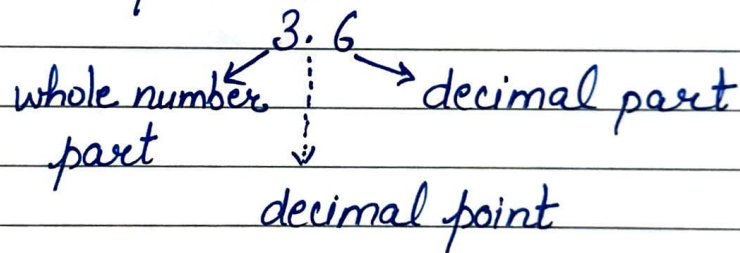
Date - 01.10.24
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Chapter - 5 Decimals

Understanding Decimals

A decimal number consists of a whole part, a decimal part, a decimal point. A point or dot (.) known as decimal point is used to separate the whole number part from the decimal part.

eg:-



- The decimal part of a decimal number is always less than one.
- The '0' in front of the decimal point tells us that the number is less than one whole.
- When one whole is divided into ten equal parts, each part is called one-tenth.
The fractional form of one-tenth is $\frac{1}{10}$.
The decimal form of one-tenth is 0.1
It is read as one-tenth. Or zero point one.

When one whole is divided into 100 equal parts, each part is called one-hundredth.

The fractional form of one-hundredth is $\frac{1}{100}$.
In decimal form, one hundredth is written as 0.01 and read as one-hundredth or zero point zero one.

When one whole is divided into 1000 equal parts, each part is called one-thousandth.

The fractional form of one-thousandth is $\frac{1}{1000}$.

The decimal form of one-thousandth is 0.001.

Exercise 5.1

Q.1 → Write as decimals.

1. three-tenths = 0.3
2. zero point seven = 0.7
3. two and three-tenths = 2.3
4. five point one = 5.1
5. two-hundredths = 0.02
6. four and three-hundredths = 4.03
7. twenty-six point three five = 26.35

Q. Write the next three decimals to complete the pattern.

1. 0.4 0.5 0.6 0.7 0.8 0.9
2. 6.34 6.35 6.36 6.37 6.38 6.39
3. 7.04 7.05 7.06 7.07 7.08 7.09

Q. Represent the numbers in the place value chart and write them in words.

1. 3.5

H	T	O	•	tenths	hundredths	thousandths
		3	.	5		
		8	.	7		
	2	0	.	6		
	1	0	.	2		
		5	.	6	2	
	1	8	.	6	8	
	2	3	.	7	5	
	2	5	.	0	3	
1	1	1	.	3	6	

Q. Build the decimals.

- 7 in the tenths place, 4 in the ones place, 8 in the tens place. $\rightarrow 84.7$
- 8 in the tenths place, 5 in the hundredths place, 6 in the ones place. $\rightarrow 6.85$
- 6 in the tenths place, 7 in the thousandths place, 8 in the tens place, 5 in the ones place. $\rightarrow 85.607$
- 4 in the ones place, 8 in the hundredths place, 5 in the tenths place, 3 in the thousandths place. $\rightarrow 804.503$

A mixed number has two parts, a whole number and a fractional part. In the decimal system, the decimal point separates the whole number from the fractional part.

Exercise 5.2

A. Convert to decimals.

$$1. \quad \frac{4}{10} = 0.4$$

$$2. \quad 2\frac{7}{10} = 2.7$$

$$3. \quad 14\frac{32}{100} = 14.32$$

$$4. \quad 6\frac{584}{1000} = 6.584$$

$$5. \quad \frac{175}{100} = 1.75$$

$$6. \quad \frac{9}{1000} = 0.009$$

$$7. \quad \frac{5}{100} = 0.05$$

$$8. \quad \frac{1964}{1000} = 1.964$$

B. Convert to fractions.

$$1. \quad 8.01 = \frac{801}{100}$$

$$2. \quad 6.35 = \frac{635}{100}$$

$$3. \quad 4.001 = \frac{4001}{1000}$$

$$4. \quad 16.8 = \frac{168 \div 2}{10 \div 2} = \frac{84}{5}$$

$$5. \quad 0.008 = \frac{8}{1000} \div \frac{8}{8} = \frac{1}{125}$$

$$6. \quad 0.01 = \frac{1}{100}$$

$$7. \quad 5.809 = \frac{5809}{1000}$$

$$8. \quad 20.02 = \frac{2002}{100} \div \frac{2}{2} = \frac{1001}{50}$$

C. Write the decimal for each fractional expansion.

$$1. \quad 1 + \frac{4}{10} = 1 + 0.4 = 1.4$$

$$2. \quad \frac{6}{10} + \frac{4}{100} = 0.6 + 0.04 = 0.64$$

$$3. \quad \frac{5}{10} + \frac{3}{100} + \frac{1}{1000} = 0.5 + 0.03 + 0.001 = 0.531$$

$$4. \quad 40 + 1 + \frac{3}{100} = 41 + 0.03 = 41.03$$

$$5. \quad 50 + 1 + \frac{7}{1000} = 51 + 0.007 = 51.007$$

$$6. \quad 10 + 9 + \frac{2}{100} + \frac{5}{1000} = 19 + 0.02 + 0.005 = 19.025$$

D. Write the decimal for each decimal expansion.

$$1. \quad 3 + 0.01 = 3.01$$

$$2. \quad 1 + 0.2 + 0.08 = 1.28$$

3. $0.5 + 0.02 + 0.001 = 0.521$

4. $10 + 4 + 0.009 = 14.009$

5. $5 + 0.1 + 0.09 + 0.008 = 5.198$

6. $0.3 + 0.008 = 0.308$

7. $200 + 20 + 0.3 = 220.3$

8. $10 + 1 + 0.2 + 0.005 = 11.205$

E Write the decimal and fractional expansions for each decimal number

1. $4.5 = 4 + 0.5 = 4 + \frac{5}{10}$

2. $15.16 = 10 + 5 + 0.1 + 0.06$
 $= 10 + 5 + \frac{1}{10} + \frac{6}{100}$

3. $0.235 = 0 + 0.2 + 0.03 + 0.005$
 $= 0 + \frac{2}{10} + \frac{3}{100} + \frac{5}{1000}$

4. $7.123 = 7 + 0.1 + 0.02 + 0.003$
 $= 7 + \frac{1}{10} + \frac{2}{100} + \frac{3}{1000}$

5. $9.107 = 9 + 0.1 + 0 + 0.007$
 $= 9 + \frac{1}{10} + 0 + \frac{7}{1000}$

$$6. \quad 126.3 = 100 + 20 + 6 + 0.3 = 100 + 20 + 6 + \frac{3}{10}$$

$$7. \quad 2.308 = 2 + 0.3 + 0.00 + 0.008 \\ = 2 + \frac{3}{10} + \frac{8}{1000}$$

$$8. \quad 1.009 = 1 + 0.009 \\ = 1 + \frac{9}{1000}$$

Exercise 5.3

A Write the equivalent decimals.

$$1. \quad 0.7 = 0.70 = 0.700$$

$$2. \quad 1.5 = 1.50 = \underline{1.500}$$

$$3. \quad 31.9 = \underline{31.90} = 31.900$$

$$4. \quad \underline{0.5} = 0.50 = 0.500$$

$$5. \quad 6.8 = \underline{6.80} = 6.800$$

$$6. \quad \underline{4.2} = \underline{4.20} = \underline{4.200}$$

Like decimals → Decimal numbers with the same number of decimal places are called like decimals.

eg:- 2.1 , 0.7 , 13.8 → one decimal place each
0.25 , 9.01 , 27.73 → two decimal places each
1.345 , 16.789 , 2.762 → three decimal places each

Unlike decimals :-→

Decimal numbers with different number of decimal places are called unlike decimals.

0.9 , 0.93
17.5 , 27.57
1.34 , 6.789

Converting unlike decimals to like decimals.

Unlike decimals can be converted to like decimals by changing them to equivalent decimals.

Unlike decimals:	3.2	7.01	4.001
	↓	↓	↓
Like decimals:	3.200	7.010	4.001

Q₁ Convert unlike decimals to like decimals.

1. $8.4, 8.41 \rightarrow 8.40, 8.41$
2. $1.61, 24.3, 1.678 \rightarrow 1.610, 24.300, 1.678$
3. $7.1, 7.01, 7.001 \rightarrow 7.100, 7.010, 7.001$
4. $30.4, 42.61, 100.123 \rightarrow 30.400, 42.610, 100.123$
5. $7.28, 8, 99.009 \rightarrow 7.280, 8.000, 99.009$
6. $60.1, 6.01, 1.006 \rightarrow 60.100, 6.010, 1.006$

Comparing and ordering decimals.

- Convert the given decimals to like decimals if they are unlike decimals.
- Compare the whole number parts of the given decimals. If the whole number parts are equal, then go to the next step.
- Now compare the digits at the tenths place. If these digits are also the same, then move to the hundredths place and so on.

Exercise 5.4

Q₁ Put $>$, $<$ or $=$ in the $\bigcirc$.

1. $2.35 \bigcirc 2.36$
2. $0.3 \bigcirc 0.2$

3. $0.80 < 0.81$

4. $5.3 < 5.4$

5. $16.01 < 16.07$

6. $6.6 = 6.60$

Q₄ Rewrite in ascending order.

1. $1.1, 1.01, 0.11, 1.11$

$= 1.10, 1.01, 0.11, 1.11$

$\rightarrow 0.11 < 1.01 < 1.10 < 1.11$

2. $2.04, 2.4, 2.24, 2.1$

$\rightarrow 2.04, 2.40, 2.24, 2.10$

$\rightarrow 2.04 < 2.10 < 2.24 < 2.40$

3. $0.5, 0.52, 0.25, 0.252$

$= 0.500, 0.520, 0.250, 0.252$

$= 0.250 < 0.252 < 0.500 < 0.520$

4. $21.1, 2.11, 0.211, 0.121$

$= 21.100, 2.110, 0.211, 0.121$

$= 0.121 < 0.211 < 2.110 < 21.100$

5. $8.6, 0.08, 0.008, 0.80$

$= 8.000, 0.080, 0.008, 0.800$

$= 0.008 < 0.080 < 0.800 < 8.000$