

## CHAPTER

## 8

## VI-MATHEMATICS-NCERT-2024-25

## 8 .DECIMALS (NOTES)

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- Fractions with denominator 10, 100, 1000, etc. (known as decimal fractions) can be written in a form using a decimal point.
- A decimal has two parts-whole number part and decimal part. ...

$$\frac{2}{10} = 0.2,$$

$$\frac{13}{10} = 1.3,$$

$$\frac{257}{10} = 25.7$$

$$\frac{4}{100} = 0.04,$$

$$\frac{27}{100} = 0.27,$$

$$\frac{358}{100} = 3.58.$$

$$\frac{4857}{1000} = 4.857$$

$$\frac{756}{1000} = 0.756,$$

$$\frac{5642}{1000} = 5.642$$

$$32.58 = 30 + 2 + \frac{5}{10} + \frac{8}{100}$$

Whole part → **32**.**58** ← Decimal part

**COMPARING DECIMALS**

First we compare the whole part, if whole parts are equal we compare decimal part.

**Example 1 : Which is greater?****(a) 1 or 0.99**

**Sol:**  $1.00 > 0.99$ .

So, 1 is greater

**(b) 1.09 or 1.093**

**Sol:**  $1.090 < 1.093$ .

So, 1.093 is greater

**EXERCISE 8.1****1. Which is greater?****(a) 0.3 or 0.4**

**Sol:**  $0.3 < 0.4$

So, 0.4 is greater

**(b) 0.07 or 0.02**

**Sol:**  $0.07 > 0.02$

So, 0.07 is greater

**(c) 3 or 0.8**

**Sol:**  $3.0 > 0.8$

So, 3.0 is greater

**(d) 0.5 or 0.05**

**Sol:**  $0.50 > 0.05$

So, 0.5 is greater

**(e) 1.23 or 1.2**

**Sol:**  $1.23 > 1.20$

So, 1.23 is greater

**(f) 0.099 or 0.19**

**Sol:**  $0.099 < 0.190$

So, 0.190 is greater

**(g) 1.5 or 1.50**

**Sol:**  $1.50 = 1.50$

**(h) 1.431 or 1.490**

**Sol:**  $1.431 < 1.490$

So, 1.490 is greater

(i) **3.3 or 3.300****Sol:**  $3.300 = 3.300$ (j) **5.64 or 5.603****Sol:**  $5.640 > 5.603$ 

So, 5.640 is greater

**Money:**

100 paise = ₹ 1

 $1 \text{ paise} = ₹ \frac{1}{100} = ₹ 0.01$  $65 \text{ paise} = ₹ \frac{65}{100} = ₹ 0.65$  $105 \text{ paise} = ₹ 1 \text{ and } 5 \text{ paise} = ₹ 1.05$ **Try These**(i) **Write 2 rupees 5 paise and 2 rupees 50 paise in decimals.****Sol:** 2 rupees 5 paise = ₹ 2.05

2 rupees 50 paise = ₹ 2.50

(ii) **Write 20 rupees 7 paise and 21 rupees 75 paise in decimals?****Sol:** 20 rupees 7 paise = ₹ 20.07

21 rupees 75 paise = ₹ 21.75

**Length:** (mm=millimetre, cm= centimetre, m= metre, km=kilometre) $1 \text{ cm} = 10 \text{ mm}$  $1 \text{ mm} = \frac{1}{10} \text{ cm}$  $156 \text{ cm} = 100 \text{ cm} + 56 \text{ cm} = 1 \text{ m} + \frac{56}{100} \text{ m} = 1.56 \text{ m}$  $1000 \text{ m} = 1 \text{ km}$  $1 \text{ m} = 100 \text{ cm}$  $1 \text{ cm} = \frac{1}{100} \text{ m} = 0.01 \text{ m}$  $1 \text{ m} = \frac{1}{1000} \text{ km}$ **Try These****1. Can you write 4 mm in 'cm' using decimals?****Sol:**  $1 \text{ mm} = \frac{1}{10} \text{ cm} = 0.1 \text{ cm}$ ;  $4 \text{ mm} = \frac{4}{10} \text{ cm} = 0.4 \text{ cm}$ **2. How will you write 7cm 5 mm in 'cm' using decimals?****Sol:**  $7 \text{ cm } 5 \text{ mm} = 7 \text{ cm} + \frac{5}{10} \text{ cm} = 7.5 \text{ cm}$ **3. Can you now write 52 m as 'km' using decimals? How will you write 340 m as 'km' using decimals? How will you write 2008 m in 'km'?**

$$1 m = \frac{1}{1000} km$$

$$\text{Sol: } 52 m = \frac{52}{1000} km = 0.052 km$$

**Weight:** (g= gram ,kg=kilogram )

$$1000 g = 1 kg$$

$$1 g = \frac{1}{1000} kg = 0.001 kg$$

$$2350 g = 2000 g + 350 g = 2 kg + \frac{350}{1000} g = 2.350 kg$$

### Try These

1. Can you now write 456g as 'kg' using decimals?

$$\text{Sol: } 456g = \frac{456}{1000} g = 0.456 g$$

2. How will you write 2kg 9g in 'kg' using decimals?

$$\text{Sol: } 2kg 9g = 2 kg + 9 g = 2 kg + \frac{9}{1000} g = 2.009 g$$

### EXERCISE 8.2

1. Express as rupees using decimals.

$$(a) 5 \text{ paise} = ₹ \frac{5}{100} = ₹ 0.05$$

$$(b) 75 \text{ paise} = ₹ \frac{75}{100} = ₹ 0.75$$

$$(c) 20 \text{ paise} = ₹ \frac{20}{100} = ₹ 0.20$$

$$(d) 50 \text{ rupees } 90 \text{ paise} = ₹ 50.90$$

$$(e) 725 \text{ paise} = 700 \text{ paise} + 25 \text{ paise} \\ = ₹ 7 + ₹ \frac{25}{100} = ₹ 7.25$$

2. Express as metres using decimals.

$$(a) 15 \text{ cm} = \frac{15}{100} m = 0.15 m$$

$$(b) 6 \text{ cm} = \frac{6}{100} m = 0.06 m$$

$$(c) 2 \text{ m } 45 \text{ cm} = 2 m + \frac{45}{100} m = 2m + 0.45m = 2.45 m$$

$$(d) 9 \text{ m } 7 \text{ cm} = 9 m + 7 \text{ cm} = 9m + \frac{7}{100} m = 9m + 0.07 m = 9.07 m$$

$$(e) 419 \text{ cm} = 400 \text{ cm} + 19 \text{ cm} = 4 m + \frac{19}{100} \text{ cm} = 4 m + 0.19 m = 4.19 m$$

3. Express as cm using decimals.

$$(a) 5 \text{ mm} = \frac{5}{10} \text{ cm} = 0.5 \text{ cm}$$

$$(b) 60 \text{ mm} = \frac{60}{10} \text{ cm} = 6 \text{ cm}$$

$$(c) 164 \text{ mm} = \frac{164}{10} \text{ cm} = 16.4 \text{ cm}$$

$$(d) 9 \text{ cm } 8 \text{ mm} = 9 \text{ cm} + \frac{8}{10} \text{ cm} \\ = 9 \text{ cm} + 0.8 \text{ cm} = 9.8 \text{ cm}$$

#### 4. Express as km using decimals.

$$(a) 8 \text{ m} = \frac{8}{1000} \text{ km} = 0.008 \text{ km}$$

$$(b) 88 \text{ m} = \frac{88}{1000} \text{ km} = 0.088 \text{ km}$$

$$(c) 8888 \text{ m} = \frac{8888}{1000} \text{ km} = 8.888 \text{ km}$$

#### 5. Express as kg using decimals.

$$(a) 2 \text{ g} = \frac{2}{1000} \text{ kg} = 0.002 \text{ kg}$$

$$(b) 100 \text{ g} = \frac{100}{1000} \text{ kg} = 0.100 \text{ kg}$$

$$(c) 3750 \text{ g} = \frac{3750}{1000} \text{ kg} = 3.750 \text{ kg}$$

$$(e) 93 \text{ mm} = \frac{93}{10} \text{ cm} = 9.3 \text{ cm}$$

$$(d) 70 \text{ km } 5 \text{ m} = 70 \text{ km} + \frac{5}{1000} \text{ km} \\ = 70 \text{ km} + 0.005 \text{ km} \\ = 70.005 \text{ km}$$

$$(d) 5 \text{ kg } 8 \text{ g} = 5 \text{ kg} + 8 \text{ g} \\ = 5 \text{ kg} + \frac{8}{1000} \text{ g} = 5.008 \text{ kg}$$

$$(e) 26 \text{ kg } 50 \text{ g} = 26 \text{ kg} + \frac{50}{1000} \text{ kg} \\ = 26.050 \text{ kg}$$

### Addition of Numbers with Decimals

To add two or more unlike decimals, we first have to convert them into like decimals and write one by one having same place.

#### Try These Find

$$(i) 0.29 + 0.36 = 0.65$$

$$\begin{array}{r} 0.29 \\ + 0.36 \\ \hline 0.65 \end{array}$$

$$(ii) 0.7 + 0.08 = 0.78$$

$$\begin{array}{r} 0.70 \\ + 0.08 \\ \hline 0.78 \end{array}$$

$$(iii) 1.54 + 1.80 = 3.34$$

$$\begin{array}{r} 1.54 \\ + 1.80 \\ \hline 3.34 \end{array}$$

$$(iv) 2.66 + 1.85 = 4.51$$

$$\begin{array}{r} 2.66 \\ + 1.85 \\ \hline 4.51 \end{array}$$

**Example 2 :** Lata spent ₹9.50 for buying a pen and ₹2.50 for one pencil. How much money did she spend?

**Solu :** Money spent for pen = ₹9.50

Money spent for pencil = ₹2.50

Total money spent = ₹12.00

$$\begin{array}{r} 9.50 \\ + 2.50 \\ \hline 12.00 \end{array}$$



**Example 3 :** Samson travelled 5 km 52 m by bus, 2 km 265 m by car and the rest 1km 30 m he walked. How much distance did he travel in all?

**Solu:** Distance travelled by bus = 5 km 52 m = 5.052 km

Distance travelled by car = 2 km 265 m = 2.265 km

Distance travelled on foot = 1 km 30 m = 1.030 km

Total distance travelled is= 8.347 km

$$\begin{array}{r} 5.052 \text{ km} \\ 2.265 \text{ km} \\ + 1.030 \text{ km} \\ \hline 8.347 \text{ km} \end{array}$$

**Example 4 :** Rahul bought 4 kg 90 g of apples, 2 kg 60 g of grapes and 5 kg 300 g of mangoes. Find the total weight of all the fruits he bought.

**Solu :** Weight of apples = 4 kg 90 g = 4.090 kg

Weight of grapes = 2 kg 60 g = 2.060 kg

Weight of mangoes = 5 kg 300 g = 5.300 kg

Total weight of the fruits bought = 11.450 kg

$$\begin{array}{r} 4.090 \text{ kg} \\ 2.060 \text{ kg} \\ 5.300 \text{ kg} \\ \hline 11.450 \text{ kg} \end{array}$$

### EXERCISE 8.3

1. Find the sum in each of the following :

(a)  $0.007 + 8.5 + 30.08 = 38.587$

$$\begin{array}{r} 0.007 \\ 8.500 \\ 30.080 \\ \hline 38.587 \end{array}$$

(b)  $15 + 0.632 + 13.8 = 29.432$

$$\begin{array}{r} 15.000 \\ 0.632 \\ 13.800 \\ \hline 29.432 \end{array}$$

(c)  $27.076 + 0.55 + 0.004 = 27.630$

$$\begin{array}{r} 27.076 \\ 0.550 \\ 0.004 \\ \hline 27.630 \end{array}$$

(d)  $25.65 + 9.005 + 3.7 = 38.355$

$$\begin{array}{r} 25.650 \\ 9.005 \\ 3.700 \\ \hline 38.355 \end{array}$$

(e)  $0.75 + 10.425 + 2 = 13.175$

$$\begin{array}{r} 0.750 \\ 10.425 \\ 2.000 \\ \hline 13.175 \end{array}$$

(f)  $280.69 + 25.2 + 38 = 343.89$

$$\begin{array}{r} 280.690 \\ 25.200 \\ 38.000 \\ \hline 343.890 \end{array}$$

2. Rashid spent ₹35.75 for Maths book and ₹32.60 for Science book. Find the total amount spent by Rashid.

**Sol:** Maths book=₹35.75

Science book=₹32.60

The total amount spent by Rashid= ₹ 68.35

$$\begin{array}{r} 1 \\ 35.75 \\ 32.60 \\ \hline 68.35 \end{array}$$

3. **Radhika's mother gave her ₹10.50 and her father gave her ₹15.80, find the total amount given to Radhika by the parents.**

**Sol:** Mother given amount=₹10.50

Father given amount=₹ 15.80

The total amount given to Radhika by the parents=₹ 26.30

$$\begin{array}{r} 1 \\ 10.50 \\ 15.80 \\ \hline 26.30 \end{array}$$

4. **Nasreen bought 3 m 20 cm cloth for her shirt and 2 m 5 cm cloth for her trouser. Find the total length of cloth bought by her.**

**Sol:** Shirt cloth= 3.20 m

Trouser cloth= 2.05 m

The total length of cloth bought by Nasreen= 5.25 m= 5 m 25 cm

$$\begin{array}{r} 3.20 \\ 2.05 \\ \hline 5.25 \end{array}$$

5. **Naresh walked 2 km 35 m in the morning and 1 km 7 m in the evening. How much distance did he walk in all?**

**Sol:** Distance walked in the morning=2 km 35 m=2.035 km

Distance walked in the evening=1 km 7 m=1.007 km

Total distance walked in all= 3.042 km=3 km 42 m

$$\begin{array}{r} 1 \\ 2.035 \\ 1.007 \\ \hline 3.042 \end{array}$$

6. **Sunita travelled 15 km 268 m by bus, 7 km 7 m by car and 500 m on foot in order to reach her school. How far is her school from her residence?**

**Sol:** Distance travelled by bus=15 km 268 m=15.268 km

Distance travelled by car=7 km 7 m=7.007 km

Distance travelled on foot= 500 m=0.500 km

Total distance from school and residence=22 km 775 m

$$\begin{array}{r} 1 \\ 15.268 \\ 7.007 \\ 0.500 \\ \hline 22.775 \end{array}$$

7. **Ravi purchased 5 kg 400 g rice, 2 kg 20 g sugar and 10 kg 850g flour. Find the total weight of his purchases.**

**Sol:** Weight of rice=5 kg 400 g=5.400 kg

Weight of sugar=2 kg 20 g=2.020 kg

Weight of flower=10 kg 850g=10.850 kg

$$\begin{array}{r} 1 \\ 5.400 \\ 2.002 \\ 10.850 \\ \hline 18.270 \end{array}$$

The total weight of his purchases = 18.270 kg = 18 kg 270 g

### Subtraction of Decimals

Write the decimals in column with the decimal points directly below each other. So, those tenths come under tenths, hundredths come under hundredths and so on.

#### Try These

1. Subtract 1.85 from 5.46 ;

Sol:  $5.46 - 1.85 = 3.61$

$$\begin{array}{r} 4 \ 14 \\ \cancel{5}. \cancel{4}6 \\ -1.85 \\ \hline 3.61 \end{array}$$

2. Subtract 5.25 from 8.28 ;

Sol:  $8.28 - 5.25 = 3.03$

$$\begin{array}{r} 8.28 \\ -5.25 \\ \hline 3.03 \end{array}$$

3. Subtract 0.95 from 2.29 ;

Sol:  $2.29 - 0.95 = 1.34$

$$\begin{array}{r} 1 \ 12 \\ \cancel{2}. \cancel{2}9 \\ -0.95 \\ \hline 1.34 \end{array}$$

4. Subtract 2.25 from 5.68.

Sol:  $5.68 - 2.25 = 3.43$

$$\begin{array}{r} 5.68 \\ -2.25 \\ \hline 3.43 \end{array}$$

**Example 5 :** Abhishek had ₹7.45. He bought toffees for ₹5.30. Find the balance amount left with Abhishek.

**Solution :** Total amount of money = ₹7.45

Amount spent on toffees = ₹5.30

Balance amount of money = ₹7.45 - ₹5.30 = ₹2.15

$$\begin{array}{r} 7.45 \\ -5.30 \\ \hline 2.15 \end{array}$$

**Example 6 :** Urmila's school is at a distance of 5 km 350 m from her house. She travels 1 km 70 m on foot and the rest by bus. How much distance does she travel by bus?

**Solution :** Total distance of school from the house = 5.350 km

Distance travelled on foot = 1.070 km

Therefore, distance travelled by bus = 5.350 km - 1.070 km = 4.280 km

$$\begin{array}{r} 2 \ 15 \\ 5.350 \\ -1.070 \\ \hline 4.280 \end{array}$$

**Example 7 :** Kanchan bought a watermelon weighing 5 kg 200 g. Out of this she gave 2 kg 750 g to her neighbour. What is the weight of the watermelon left with Kanchan?

**Solution :** Total weight of the watermelon = 5.200 kg

Watermelon given to the neighbour = 2.750 kg

$$\begin{array}{r} 4 \ 11 \\ \cancel{5}. \cancel{2}00 \\ -2.750 \\ \hline 2.450 \end{array}$$



Therefore, weight of the remaining watermelon =  $5.200 \text{ kg} - 2.750 \text{ kg}$

$$= 2.450 \text{ kg}$$

### EXERCISE 8.4

1. Subtract :

(a) ₹18.25 from ₹20.75

*Sol:* ₹20.75 – ₹18.25 = ₹2.50

$$\begin{array}{r} 1 \text{ } 10 \\ 20.75 \\ -18.25 \\ \hline 2.50 \end{array}$$

(b) 202.54 m from 250 m

*Sol:*  $250\text{m} - 202.54\text{m} = 47.46 \text{ m}$

$$\begin{array}{r} 4 \text{ } 9 \text{ } 9 \text{ } 10 \\ 250.00 \\ -202.54 \\ \hline 47.46 \end{array}$$

(c) ₹5.36 from ₹8.40

*Sol:*  $8.40 - 5.36 = ₹3.04$

$$\begin{array}{r} 3 \text{ } 10 \\ 8.40 \\ -5.36 \\ \hline 3.04 \end{array}$$

2. Find the value of :

(a)  $9.756 - 6.28 = 3.476$

$$\begin{array}{r} 6 \text{ } 15 \\ 9.756 \\ -6.280 \\ \hline 3.476 \end{array}$$

(b)  $21.05 - 15.27 = 5.78$

$$\begin{array}{r} 1 \text{ } 10 \text{ } 9 \text{ } 15 \\ 21.05 \\ -15.27 \\ \hline 5.78 \end{array}$$

(d) 2.051 km from 5.206 km

*Sol:*  $5.206 \text{ km} - 2.051 \text{ km} = 3.155 \text{ km}$

$$\begin{array}{r} 1 \text{ } 10 \\ 5.206 \\ -2.051 \\ \hline 3.155 \end{array}$$

(e) 0.314 kg from 2.107 kg

*Sol:*  $2.107 \text{ kg} - 0.314 \text{ kg} = 1.793 \text{ kg}$

$$\begin{array}{r} 1 \text{ } 10 \text{ } 10 \\ 2.107 \\ -0.314 \\ \hline 1.793 \end{array}$$

(c)  $18.5 - 6.79 = 11.71$

$$\begin{array}{r} 7 \text{ } 14 \text{ } 10 \\ 18.50 \\ -6.79 \\ \hline 11.71 \end{array}$$

(d)  $11.6 - 9.847 = 1.753$

$$\begin{array}{r} 10 \text{ } 15 \text{ } 9 \text{ } 10 \\ 11.600 \\ -9.847 \\ \hline 1.753 \end{array}$$



3. **Raju bought a book for ₹35.65. He gave ₹50 to the shopkeeper. How much money did he get back from the shopkeeper?**

**Sol:** Money given to the shopkeeper = ₹50

Cost of book = ₹ 35.65

Money get back from the shopkeeper = ₹50 - ₹ 35.65 = ₹ 14.35

$$\begin{array}{r} 49.90 \\ -35.65 \\ \hline 14.35 \end{array}$$

4. **Rani had ₹18.50. She bought one ice-cream for ₹11.75. How much money does she have now?**

**Sol:** Money with Rani = ₹18.50

Cost of ice-cream = ₹11.75

Money left with Rani = ₹18.50 - ₹11.75 = ₹ 6.75

$$\begin{array}{r} 71.40 \\ -11.75 \\ \hline 6.75 \end{array}$$

5. **Tina had 20 m 5 cm long cloth. She cuts 4 m 50 cm length of cloth from this for making a curtain. How much cloth is left with her?**

**Sol:** Total length of cloth = 20 m 5 cm = 20.05 m

Length of cloth used = 4 m 50 cm = 4.50 m

Cloth left with Tina = 20.05 m - 4.50 m

= 15.55 m

$$\begin{array}{r} 19.05 \\ -4.50 \\ \hline 15.55 \end{array}$$

6. **Namita travels 20 km 50 m every day. Out of this she travels 10 km 200 m by bus and the rest by auto. How much distance does she travel by auto?**

**Sol:** Total distance travel by Namita = 20 km 50 m = 20.050 km

Distance travelled by bus = 10 km 200 m = 10.200 km

Distance travelled by auto = 20.050 km - 10.200 km

= 9.850 km

$$\begin{array}{r} 19.90 \\ -10.20 \\ \hline 9.850 \end{array}$$

7. **Aakash bought vegetables weighing 10 kg. Out of this, 3 kg 500 g is onions, 2 kg 75 g is tomatoes and the rest is potatoes. What is the weight of the potatoes?**

**Sol:** Total weight of vegetables bought by Aakash = 10 kg = 10.000 kg

Total weight of onions and tomatoes = 3 kg 500 g + 2 kg 75 g

=5 kg 575 g

=5.575 kg

The weight of the potatoes =  $10.000 - 5.575 = 4.425$  kg

$$\begin{array}{r} \overset{9}{1} \overset{9}{0} \overset{9}{0} \overset{10}{0} \\ - 5.575 \\ \hline 4.425 \end{array}$$

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