Another Peek Beyond the Point Class 7 Notes Maths Part 2 Chapter 4

Decimal Fractions

The fractional numbers whose denominators are powers of 10 are called decimal fractions. A decimal fraction consists of two parts: a whole number part and a decimal part. A dot is put between these two parts called the decimal point.

Example: In 72.521, the whole number part is 72 and the decimal part is 521. A decimal fraction can be written in expanded form as follows: 72.521 = 7 tens + 2 ones + 5 tenths + 2 hundredths + 1 thousandths = 70 + 2 + 510+2100+11000

Tenths

If an object is divided into 10 equal parts, then each part is one-tenth of the whole.
It is written as 110 or 0.1 and read as ‘zero point one.’

Hundredths

If an object is divided into 100 equal parts, then each part is one-hundredth of the whole.
It is written as 1100 or 0.01 and read as ‘zero point zero one’.

Thousandths

If an object is divided into 1000 equal parts, then each part is one-thousandth of the whole.
It is written as 11000 or 0.001 and read as ‘zero point zero zero one.’ In decimals, we have some distinctions, which are as follows:

- A decimal number may contain a whole number and a decimal part, 0.6, 0.23, 6.28, etc.
- If the decimal number consists only decimal part, then zero can be written in the whole part, i.e., .2 = 0.2, .04 = 0.04, etc.
- If the decimal numbers consist only whole part, then zero can be written in the decimal part. i.e. 3 = 3.0, 50 = 50.0 etc.

Conversion of Decimal Fraction into Fractional Number

- Write the given number without the decimal point in the numerator.
- Write 1 in the denominator, followed by as many zeros as the decimal places.
- Write the resulting fraction in the lowest term.

- Example: 4.16 = 416100=10425

Conversion of Fractions to Decimal Numbers Count the number of Zeroes following 1 in the denominator. Count an equal number of places in the numerator starting from the unit digit, then place the decimal. Example:

- 632100 = 6.32
- 24010000 = 0.0240

Length or Distance

Conversion of mm into cm.
10 mm = 1 cm
1 mm = 110 cm = 0.1 cm
Similarly, 54 mm = 5410 cm = 5.4 cm
505 mm = 50510 cm = 50.5 cm

Conversion of cm into m. 100 cm = 1 m 1 cm = 1100 m = 0.01 m
Similarly, 10 cm = 10100 m = 0.1 m
50 cm = 50100 m = 0.50 m
130 cm = 100 cm + 30 cm
= 1 m + 30 cm
= 1 m + 30100 m = 1 m + 0.30 m = 1.30 m

Conversion of m into km. 1000 m = 1 km 1 m = 11000 km = 0.001 km
Similarly, 46 m = 461000 = 0.046 km

Weights

Conversion of a gram into a kilogram
We know that
1000 gm = 1 kg
1 gm = 11000 kg = 0.001 kg
Similarly, 50 gm = 501000 kg = 0.050 kg
1150 gm = 1000 gm + 150 gm
= 1 kg + 1501000 kg = 1 kg + 0.150 kg = 1.150 kg

Capacity

Conversion of millilitres into litres.
We know that
1000 ml = 1 l
1 ml = 11000 l = 0.001 l

Decimal Multiplication

Multiplication of decimal numbers with whole numbers Multiply them as whole numbers. The product will contain the same number of digits after the decimal point as the decimal number. Example: 11.2 × 4 = 44.8

Multiplication of decimals with powers of 10 If a decimal is multiplied by a power of 10, then the decimal point shifts to the right by the number of zeros in its power. For example: 55.678 × 10 = 556.78 (decimal point shifts by 1 place to the right) or, 55.678 × 1000 = 55678 (decimal point shifts by 3 places to the right). We know how easy it is to multiply a whole number by 10, 100, 1000, etc. For example, let us take the number 25.

$$25 \times 10 = 250$$

$$25 \times 100 = 2500$$

$$25 \times 1000 = 25000$$

Decimal Number to Fraction

$$5.25 = \frac{525}{100}$$

$$5.25 \times 10 = \frac{525}{100} \times 10$$

$$= \frac{525}{10\cancel{0}} \times 1\cancel{0}$$

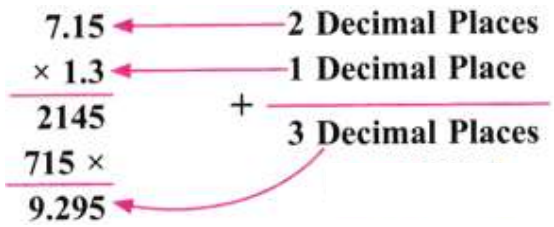
$$= \frac{525}{10} = 52.5$$

Multiplication of Decimals with Decimals Multiply the decimal numbers without decimal points and then give a decimal point in the answer as many places as the total number of places right to the decimal points in both numbers. For example: 1.68 × 25.9 Step 1: 168 × 259 = 43512 Step 2:

$$1.\underbrace{68}_{\text{2 decimal places}} \times 25.\underbrace{9}_{\text{1 decimal place}} = 43.\underbrace{512}_{\text{3 decimal places}}$$

To multiply two decimals, follow the steps listed below: Step 1: Initially, ignore the decimal point and multiply the two numbers normally. Step 2: After multiplication, count the total number of decimal places in both numbers. The product obtained after multiplication will have this total number of

decimal places. Step 3: Place the decimal point in the obtained product following Step 2. Let us see the multiplication of two decimal numbers given below:



The decimal multiplication follows the same procedure as the multiplication of whole numbers. The decimal point should be placed in the product in such a way that the product has several decimal places equal to the sum of decimal places of all the multiplicands and the multipliers. Make sure you keep all the zeros in the product while placing the decimal point. If the product has more decimal places than the number of digits, zeros can be inserted on the left before placing the decimal point in the product. The trailing zeros in the resultant product can be dropped.

Is the product always greater than the numbers multiplied No, the product is not always greater than the numbers being multiplied. A product is only greater than the original numbers when both numbers are greater than 1. If we multiply by a number less than 1, the product will be smaller, and if we multiply by a negative number, the product can also be smaller than the original number. Here are some examples: When both numbers are greater than 1: 4 × 3 = 12. The product (12) is greater than both 4 and 3. When one number is less than 1: 8 × 0.4 = 3.2. The product (3.2) is less than 8. When a number is negative: -4 × 6 = -24. The product (-24) is less than -4. When one number is 1: 5 × 1 = 5. The product is the same as the second number, not greater.

Decimal Division

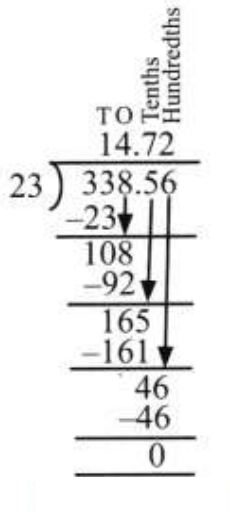
Dividing Decimals is similar to dividing whole numbers, keeping in mind the position of the decimal point.

Dividing a decimal number by a decimal number Example: 42.250.5
Step 1. Convert both the decimal numbers into fractions:
45.25 = 4525100 and 0.5 = 510
Step 2. Divide the fractions: 4525100÷510
= 4525100×105
= 90510 = 90.5

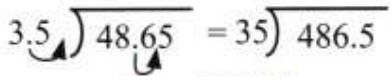
Dividing a decimal number by powers of 10 If a decimal is divided by a power of 10, then the decimal point shifts to the left by the number of zeros present in the power of 10.

Long Division of Decimals The long division of decimals can be easily done like the normal long division. Let us understand this using an example. Step 1: First, write the division in the standard form. Start by dividing the whole number part by the divisor. Step 2: Place the decimal point in the

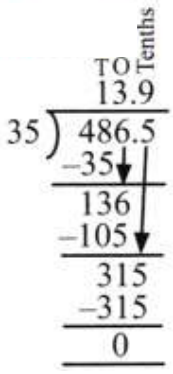
quotient above the decimal point of the dividend. Bring down the tenth digit. Step 3: Divide and bring down the other digit in sequence. Divide until 0 is obtained in the remainder. Thus, the decimal in the quotient is placed according to the decimal in the dividend. Example: Divide 338.56 ÷ 23



Dividing Decimals by Decimals For dividing decimals by another decimal, we need to convert the divisor into a whole number and then continue the division. Example: Divide 48.65 ÷ 3.5 In this division, the dividend and the divisor are decimals, so we need to convert the divisor to a whole number using the following steps. Identify the divisor and the dividend.
Move both the decimal points until the divisor becomes a whole number.



Divide:



Step 1: The dividend is 48.65, and the divisor is 3.5. We need to change the divisor to a whole number, and so we will multiply it by 10 so that the decimal point shifts to the right and it becomes a whole number. This means, 3.5 × 10 = 35. Step 2: We need to treat the dividend in the same way as we had treated the divisor. So, we will multiply the dividend by 10 as well. This means it will be 48.65

× 10 = 486.5. In other words, we need to move both the decimal points to the right until the divisor becomes a whole number. Step 3: Now, we have 486.5 as the dividend and 35 as the divisor. This can be divided as we do the usual division, and we get 13.9 as the quotient.

Convert the divisor to a whole number by multiplying by the powers of 10. Multiply the dividend by the same powers of 10. To divide a decimal number by 10, move the decimal point to the left by one place.

Look Before You Leap

In the Gregorian calendar, a year is a little longer than 365 days — it's 365.2422 days. This small extra part adds up every year, so we add 1 extra day every 4 years to fix it — that's a leap year. But adding a day every 4 years gives a little too much correction. So in years like 100, 200, 300, we skip the extra day, and only keep it in years like 400. These rules help keep our calendar exactly matching the seasons.

In this chapter, we learnt procedures to perform decimal multiplication and division. For decimal multiplication, we first multiply the multiplier and multiplicand as counting numbers. The number of decimal digits in the product is the total number of decimal digits in the multiplier and multiplicand.

Division of decimals uses the same procedure, i.e., division using place value (long division), as with counting numbers. The regrouping continues after the Ones place to Tenths, Hundredths, Thousandths, and so on. When the Ones are regrouped to Tenths, a decimal point is placed in the quotient. There are decimal divisions where the quotient never ends. After each regrouping and dividing, there is always a remainder!