Multiplication and division of decimals

Multiplication and division of decimals

We multiply decimals in a similar way as we multiply whole numbers.

- We multiply the numbers ignoring the decimal point.
- The decimal is put in the product from the right after as many digits as the total number of decimal places in the multiplicand.

Let us understand with an example: 39.8×12

Example: Find the product of

Solution: -

- Multiply the numbers as whole numbers ignoring the decimal point.
- Put the decimal point in the product from the right, after as many digits as the total number of decimal places in the multiplicand. In this case it is after 2 digits.

Multiplication of a Decimal by 10, 100 and 1,000

By 10

On multiplying a decimal number by 10, the decimal point moves one place to the right of the decimal number.

Example: a. $5.49 \times 10 = 54.9$ b. $8.9 \times 10 = 89.0$ c. $0.05 \times 10 = 0.5$

By 100

On multiplying a decimal number by 100, the decimal point moves two places to the right

of the decimal number.

Example: a. 5.81 × 100 = 581 b. 7.6 × 100 = 760 c. 0.09 × 100 = 9

By 1,000

On multiplying a decimal number by 1, 000 the decimal point moves three places to the right of the decimal number.

Example: a. 6.59 × 1000 = 6,590 b. 4.3 × 1000 = 4,300 c. 5.168 × 1000 = 5, 168

Multiplication of a Decimal by another Decimal Example:

Example: Multiply 6.25 by 2.5.

Solution:

- Multiply as you multiply whole numbers, ignoring the decimal point.
- Count the number of decimal places in the multiplicand and the multiplier and add the number of decimal places.
- Put the decimal point in the product from the right, after as many digits as the total number of decimal places. In this case it is after 3 digits.

Division of Decimal Numbers

Division of Decimal By another Decimal:

When we divide decimals, we have to convert the divisor to a whole number by moving the decimal point to the right. Then, we carry the dividend's decimal point up to the same number of places to the right and divide the resultant numbers in the usual way as we perform in regular long division.

The following steps are to be followed while dividing a decimal number by a decimal number.

- Form a fraction with the decimal number to be divided or the dividend as the numerator and the divisor decimal number as the denominator.
- Multiply both the terms of the fraction formed in the previous step by 10 or 100 or 1000, so that the decimal point in the denominator is removed, thus dividing the numbers.

Let us understand with an example:

Example: Divide 5.944 by 0.8

Solution: $5.944 \div 0.8 = (5.944 \times 10) \div (0.8 \times 10)$

- Move the decimal point 1place to the right in both the dividend and the divisor by multiplying each by 10.
- Now, since the divisor is converted into a whole number, proceed with the division as done in the previous example.

Division of Decimal Numbers



Hence, 5.944 ÷ 0.8 = 7.435.944 ÷ 0.8 = 7.43

Division of a decimal by a whole number:

Rules for Decimal Division by a Whole Number

- We use division or long division of decimals by whole numbers as if the decimals were whole numbers ignoring the decimal points.
- In the quotient that we get, we place the decimal point in the same spot as in the number that is being divided.

Let us understand with an example:

Example: A string 32. 97 m long is divided into 7 equal parts. What is the length of each part?

Solution: To find the length of each part divide 32.97 by 7.

- Divide the whole number part of the decimal.
- Place the decimal point in the quotient directly above the decimal point in the dividend.

Division of Decimal Numbers

Let us understand with an example:

Example: A string 32. 97 m long is divided into 7 equal parts. What is the length of each part?

Solution: To find the length of each part divide 32.97 by 7.

- Divide the whole number part of the decimal.
- Place the decimal point in the quotient directly above the decimal point in the dividend.

The length of each part of the string is 4.71m.

Division of a Decimal by 10, 100, 1000

The decimal point shifts by 1, 2 or 3 places to the left when a decimal number is divided by

10, 100 or 1, 000 respectively.

Let us understand with an example:

Example: Divide the following.

a. 5. 99 ÷ 10 = 0.599 b. 784. 8 ÷ 100 = 7.848

c. 5.26 ÷ 100 = 0.0526

(Note: An extra zero is placed to complete the decimal place.)

d. 532. 8 ÷ 1000 = 0. 5328 e. 469. 52 ÷ 100 = 4. 6952