

Numbers like 345.79 are said to be written in the decimal form and we may simply refer to them as **decimals**.

The decimal 345.79 is made up of

$$300 + 40 + 5 + \frac{7}{10} + \frac{9}{100}.$$

Simplifying this, we have $345\frac{79}{100}$ or $\frac{34\,579}{100}$.

Thus, we see that the decimal 345.79 is in fact the fraction $\frac{34\,579}{100}$.

Shifting of Decimal Point

Study the decimals 0.843, 8.43 and 84.3. How are they related to one another?

We have $0.843 = \frac{843}{1\,000}$,

$$8.43 = \frac{843}{100},$$

and $84.3 = \frac{843}{10}$.

We have $0.843 \xrightarrow[+10]{\times 10}$ 8.43 because $\frac{843}{1\,000} \xrightarrow[+10]{\times 10} \frac{843}{100}$

and $0.843 \xrightarrow[+100]{\times 100}$ 84.3 because $\frac{843}{1\,000} \xrightarrow[+100]{\times 100} \frac{843}{10}$ and so on.

In general, we have the following rules.

1. To multiply a decimal by 10, 100, . . . , move the decimal point 1 place, 2 places, . . . to the right.
2. To divide a decimal by 10, 100, . . . , move the decimal point 1 place, 2 places, . . . to the left.

Addition

The vertical arrangement is a convenient way of adding decimals. The decimal points must be in alignment to keep digits having the same place value in the same column.

Worked Example 7

Calculate $84.01 + 120.92$.

Solution:

$$84.01 + 120.92 = 204.93$$

$$\begin{array}{r} 84.01 \\ + 120.92 \\ \hline 204.93 \end{array}$$

5.3 ALGEBRAIC TERMS

Expressions such as $3 \times n$, $x \times 4$, $1 \times c$ and $a \times b$ can be written as $3n$, $4x$, c and ab . These are referred to as **algebraic terms**.

A part of an algebraic expression which is a product of numbers and variables and is separated from the rest of the expression by plus or minus signs is called a term. The numbers and letters which are multiplied in a term are called factors of the term. The numerical factor is called the coefficient of the term.

In the term $3n$, n is the variable and the number 3 attached to it is called the **coefficient** of the term $3n$. Likewise, the number 4 is the coefficient of the term $4x$. What is the coefficient of c ? What about ab ? Can you explain why?

Examples

- (a) Find the sum of $3a$ and $4a$.

$3a$ means $3 \times a$, i.e. 3 groups of a .

$4a$ means $4 \times a$, i.e. 4 groups of a .

Adding 3 groups of a and 4 groups of a gives 7 groups of a .

We write

$$3a + 4a = 7a.$$

Notice that the terms $3a$ and $4a$ have the same variable. We call them **like terms**. When adding like terms, we simply add the coefficients.

- (b) Find the sum of $3a$ and $4b$.

$3a$ and $4b$ are **unlike terms** because they have different variables. We do not add the coefficients of unlike terms. So, adding $3a$ and $4b$ gives $3a + 4b$.

Worked Example 3

Find the sum of

- (a) $5a$ and $-7a$,

- (b) $-3a$ and $-4ab$.

Solution:

$$\begin{aligned} \text{(a) } 5a + (-7a) &= (5 - 7)a \\ &= -2a \end{aligned}$$

$$\text{(b) } -3a + (-4ab) = -3a - 4ab$$

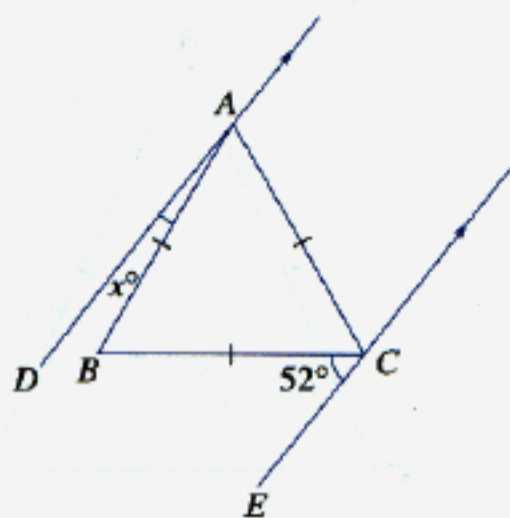
Note: The terms $-3a$ and $-4ab$ are unlike terms because their 'variable parts' are not exactly the same.

Worked Example 4

Find the product of

- (a) $3a$ and $4b$,

- (b) $-3a$ and $(-4ab)$.

Worked Example 5Find the value of x .**Solution:**

$$\hat{BAC} = \hat{ACB} = 60^\circ \text{ (equilateral } \triangle)$$

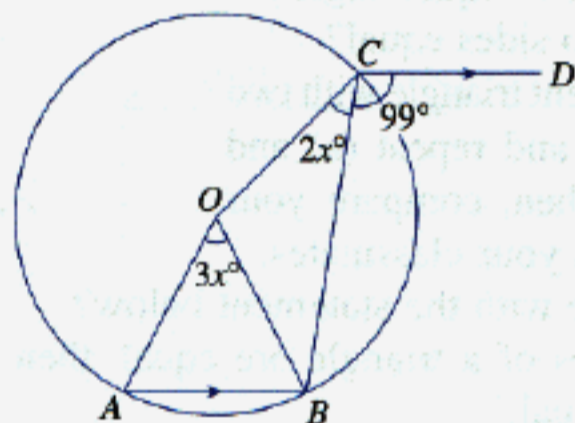
$$\hat{DAC} + \hat{ECA} = 180^\circ \text{ (int } \angle\text{s, } DA \parallel EC)$$

$$x^\circ + 60^\circ + 60^\circ + 52^\circ = 180^\circ$$

$$\therefore x = 8$$

Worked Example 6

In the figure, O is the centre of the circle.
Form an equation in x and solve the equation.

**Solution:**

$$\hat{OBC} = 2x^\circ \text{ (iso } \triangle OBC)$$

$$\hat{ABO} = \frac{1}{2}(180^\circ - 3x^\circ) \text{ (iso } \triangle ABO \text{ and } \angle \text{ sum of } \triangle)$$

$$\hat{ABC} = \hat{BCD} \text{ (alt } \angle\text{s, } AB \parallel CD)$$

$$\hat{ABO} + \hat{OBC} = 99^\circ$$

$$\frac{1}{2}(180^\circ - 3x^\circ) + 2x^\circ = 99^\circ$$

$$180^\circ - 3x^\circ + 4x^\circ = 198^\circ$$

$$\therefore x = 18$$

Exercise 10.3

answers on p. 433

1. Find the value of x in each case.

(a)



(b)



(c)

