

fs4u

Formulae

‘How To’ Booklet 28

Formulae

Algebraic formulas

Example 1

Find the value of y if $x = 4$ in the formula $y = 3x + 2$

$$\begin{aligned} y &= (3 \times 4) + 2 \text{ (always do multiply and divide before add and subtract)} \\ y &= 12 + 2 \\ y &= \underline{14} \end{aligned}$$

Example 2

Find the value of y in the formula $\frac{x^2 - 3x + 1}{x}$ when $x = -2$

$$\frac{(-2) \times (-2) - 3 \times (-2) + 1}{2}$$

$$('-' \times '-' = '+') \longrightarrow \frac{4 - (-6) + 1}{-2} \longleftarrow ('+' \times '-' = '-')$$

$$= \frac{4 + 6 + 1}{-2}$$

$$= \underline{10} + 1$$

$$= -5 + 1$$

$$\text{So } y = -4$$

$$= 10 \div (-2) + 1$$

$$= -4$$

Activity A

1	Find the value of y in the formula $y = 5x - 2$ when x takes the following values:-									
	a	$x = 2$	b	$x = 3$	c	$x = 7$	d	$x = 0$	e	$x = -4$
2	Find the value of y in the formula $y = 3x^2 - 2x + 5$ when x takes the following values:-									
	a	$x = 1$	b	$x = 2$	c	$x = 17$	d	$x = -3$	e	$x = -11$

Everyday formulae

Example

Electricity bills are calculated using the following formula:

$$\text{TOTAL BILL} = \text{Standing charge} + (\text{number of units used} \times \text{price of each unit})$$

How much would the total bill be if the standing charge is £12.36 and 1865 units have been used at a cost of 7.96 per unit.

$$\begin{aligned}\text{TOTAL BILL} &= £12.36 + (1865 \times 7.96\text{p}) \\ &= £12.36 + 14845.4\text{p} \\ &= £12.36 + £148.45 \text{ (to the nearest penny)} \\ &= \mathbf{£160.81}\end{aligned}$$

Activity B

Using the formula above, with the standing charge of £12.36 and a unit cost of 7.96p, find the total bill for each of the following units used.

a	600 units	b	796 units	c	914 units	d	1048 units	e	1485 units
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