

Substituting into Formulae

A formulae is a type of equation that involves letters representing numbers. You simply have to swap the letters for the numbers, and then work out the calculation. This isn't as hard as you may think.

Example 1

$f = p + 4$
Find the value of f when $p = 6$

$$f = 6 + 4$$

$$f = 10$$

Given you are told p is 6, you can swap the 9 for a 6.

A few important things to remember

$$t = 3b$$

A number next to a letter like this means to do '3 times b'

$$t = ab$$

Similar to before, this means to do 'a times b'

$$t = \frac{4}{m}$$

This means 4 divided by m.

$$t = a^2$$

a^2 means to do a times itself.

!--Watch out for Negative Numbers --!

A negative number multiplied by itself is always positive.

$$-3 \times -4 = 12$$

$$(-5)^2 = -5 \times -5 = 25$$

Always have brackets around negative numbers when squaring, otherwise your calculator will do GEMS and do the exponential before the negative..

Once you have swapped the letters for the numbers. You need to follow the correct order of operations using G.E.M.S or BIDMAS

Example 2

$$B = \frac{2.35T}{3 + V}$$

Find the value of B when $T = 2.1$ and $V = 0.2$

$$B = \frac{2.35 \times 2.1}{3 + 0.2}$$

$$B = \frac{4.935}{3.2}$$

$$B = 1.5421875$$

Swap 2.1 for T and 0.2 for V.

A number next to a letter means to times.

Work them out using a calculator.

Show all your working out.

Example 3

$$P = 5x^2 + 9$$

Find the value of P when $x = -5$

$$P = 5(-5)^2 + 9$$

$$P = 5 \times -5 \times -5 + 9$$

$$P = 125 + 9$$

$$P = 134$$

Swap x for -5, remember the brackets.
 $5(-5)^2$ means
 $5 \times -5 \times -5 = 125$
You can do this on a calculator. Add 9 at the end.

Example 4

$$D = 0.2L(a + b)T$$

Swap the letters for the numbers. When a number is next to a letter write \times . Then multiply from left to right using a calculator.

Find D when:

$$L = 20 \quad b = 3$$

$$a = 4 \quad T = 6$$

$$D = 0.2 \times 20(4 + 3) \times 6$$

$$D = 0.2 \times 20 \times 7 \times 6$$

$$D = 168$$