

BASIC MASTERY

- 1 Make x the subject of the formula in each of the following formulae.

(a) $a = bx + 4c$

(b) $h = g(3k + x)$

(c) $m = \frac{2x - n}{4}$

(d) $q = \frac{p}{2}(x - 1)$

(e) $l = \frac{4m + 8}{x}$

(f) $h = \frac{g}{x - 2}$

- 2 It is given that $y = mx + c$.

(a) Make x the subject of the formula.

(b) Hence find the value of x when $y = 4$, $m = 3$ and $c = -2$.

3 If $h = \frac{k - g}{x - 4}$,

(a) make x the subject of the formula,

(b) find the value of x when $h = 2$, $g = 10$ and $k = -3.5$.

4 In each case, make the letter in the square brackets the subject of the formula.

~~(a)~~ $s = \frac{x+4}{2x-3}$ [x]

~~(b)~~ $y = \frac{8w-t}{5t+4}$ [t]

~~(c)~~ $\frac{t-u}{2v} = \frac{3}{4n}$ [n]

~~(d)~~ $4q = \frac{3v}{h} - \frac{4}{v}$ [h]

~~(e)~~ $a = \sqrt{2b-4y}$ [y]

~~(f)~~ $4a = \sqrt{\frac{r+b}{3r-b}}$ [r]

~~(g)~~ $k = \frac{5m+w^2}{2}$ [w]

~~(h)~~ $L = \sqrt{t^2-y^2}$ [t]

5 Given $h = 3\sqrt{\frac{x-5}{2+3x}}$,

(a) make x the subject of the formula,

(b) find the value of x when $h = 4$.

6 Given $\frac{1}{n} + \frac{x}{m} = \frac{x}{n}$,

(a) make x the subject of the formula,

(b) find the value of x when $m = -2$ and $n = \frac{3}{4}$.

7 The formula to convert C degrees Celsius to F degrees Fahrenheit is given by $F = \frac{9}{5}C + 32$.



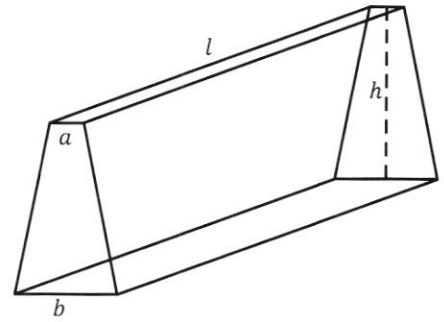
(a) Make C the subject of the formula.

(b) Find the temperature in degrees Celsius when the temperature is 90 degrees Fahrenheit.

(c) Find the temperature such that the values in degrees Celsius and degrees Fahrenheit are equal.

- 8 A formula relating volume, $V \text{ cm}^3$, of a trapezoidal prism and its dimensions is $V = \frac{lh}{2}(a + b)$, where the lengths are given in cm.

(a) Make h the subject of the formula.



(b) Hence find the value of h when $V = 1440$, $l = 40$, $a = 2.5$ and $b = 5.5$.

- 9 At a publishing factory, the cost of printing one book, $\$x$, is given by the formula $x = c + \frac{90}{n}$, where c is a constant and n is the number of books to be printed.

When 30 books are printed, printing each book costs $\$15.50$.

(a) Find the value of c .

(b) Find the total cost of printing 80 books.

(c) (i) Make n the subject of the formula.


(ii) If the cost of printing one book is $\$12.65$, find the number of books printed.

10 Make x the subject of the formula in each of the following.

(a) $(x + y)(x - y) - 2 = 0$


(b) $4x^2 - 12xy + 9y^2 - 4 = 0$

11 The variables x , y and z are related by the formulae $y = \frac{x+2}{3-x}$ and $z = \sqrt{5 - \frac{x}{2}}$.

 (a) By first expressing x in terms of y , and x in terms of z , express z in terms of y .

(b) Hence find the value of z when $y = 4$.

12 Three positive integers x , y and z are related by the formula $\frac{1}{x} + \frac{2}{y} = \frac{1}{z} + \frac{1}{2}$.

 (a) Is it possible that $x = 5$ and $y = 7$? Explain.

(b) If $x = 3$, find a possible set of values for y and z .