Exercise 1.6

1. In each of the following, express x in terms of the other variables.

(i) $3x - 2y = 4$ (ii) $2x - b = 4c$ (iii) $5x - 4 = \frac{y}{2}$

$5x - 4 = \frac{y}{2}$

$+4$ $5x = \frac{y}{2} + 4$

$\div 5$ $x = \frac{\frac{y}{2} + 4}{5}$ ✓

method 2

$5x - 4 = \frac{y}{2}$

$\times 2$ $10x - 8 = y$

$+8$ $10x = y + 8$

$\div 10$ $x = \frac{y+8}{10}$ ✓

1. In each of the following, express x in terms of the other variables.

(iv) $5(x - 3) = 2y$ (v) $3y = \frac{x}{3} - 2$ (vi) $xy = xz + yz$

$3y = \frac{x}{3} - 2$

$\times 3$ $9y = x - 6$

swap $x - 6 = 9y$

$+6$ $x = 9y + 6$

$xy = xz + yz$

$-xz$ $xy - xz = yz$

HCF $x(y - z) = yz$

$\div (y-z)$ $x = \frac{yz}{y-z}$

2. Express x in terms of the other variables in each of the following:

(i) $2x - \frac{y}{3} = \frac{1}{3}$ (ii) $z = \frac{y - 2x}{3}$ (iii) $\frac{a}{x} - b = c$

$2x - \frac{y}{3} = \frac{1}{3}$

$\times 3$ $\quad 6x - y = 1$

$+y$ $\quad 6x = 1 + y$

$\div 6$ $\quad x = \frac{1+y}{6}$

$z = \frac{y-2x}{3}$

$\times 3$ $\quad 3z = y - 2x$

$+2x, -3z$ $\quad 2x = y - 3z$

$\div 2$ $\quad x = \frac{y-3z}{2}$

7. In each of the following, express a in terms of the other variables:

(i) $\frac{x}{y} = \frac{a+b}{a-b}$ (ii) $bc - ac = ac.$

$bc - ac = ac$

swap $\quad ac = bc - ac$

$+ac$ $\quad 2ac = bc$

$\div 2c$ $\quad a = \frac{b}{2}$

10. Write c in terms of the other variables in each of the following.

(i) $d = \sqrt{\frac{a-b}{ac}}$ (ii) $b = \frac{2c-1}{c-1}$

$d = \sqrt{\frac{a-b}{ac}}$

Square $\quad d^2 = \frac{a-b}{ac}$

$\times c \quad cd^2 = \frac{a-b}{a}$

$\div d^2 \quad c = \frac{a-b}{ad^2}$

$b = \frac{2c-1}{c-1}$

$\times(c-1) \quad b(c-1) = 2c-1$

expand $\quad bc - b = 2c - 1$

$-2c + b \quad bc - 2c = b - 1$

HCF $\quad c(b-2) = b-1$

$\div(b-2) \quad c = \frac{b-1}{b-2}$