Substitution

Formulae from Physics

$$v = u + at$$

Find v when $u = 0$, $a = 9.81$, $t = 3$

$$V = 0 + 9.81 \times 3$$

$$V = 29.43$$

Ex2

$$S = ut + \tfrac{1}{2}at^2$$

Find s when $u = 4$, $a = 10$, $t = 5$

$$S = 4 \times 5 + \tfrac{1}{2} \times 10 \times 5^2$$

$$S = 20 + 125$$

$$S = 145$$

Ex3

$$v^2 = u^2 + 2as$$

Find v when $u = 4$, $a = 7$, $s = 100$

$$v^2 = 4^2 + 2 \times 7 \times 100$$

$$v^2 = 1416$$

$$V = \sqrt{1416}$$

$$V = 37.6$$

Q 6a, 7a, 8a, 9a, 9b

6a)
$$P = \frac{5w - 4y}{w + y} \qquad w = 3 \\ y = 2$$

$$P = \frac{5 \times 3 - 4 \times 2}{3 + 2} = \frac{7}{5}$$

$$P = \frac{7}{5} \quad \text{or} \quad 1.4$$

7a)
$$A = b^2 + c^2 \qquad b = 2 \\ c = 3$$

$$A = 2^2 + 3^2$$

$$A = 13$$

8a)
$$A = \frac{180(n-2)}{n+5} \qquad n = 7$$

$$A = \frac{180(7-2)}{7+5} = \frac{900}{12} = 75$$

$$A = 75$$

9a)
$$Z = \frac{y^2 + 4}{4 + y} \qquad y = 4$$

$$Z = \frac{4^2 + 4}{4 + 4} = \frac{20}{8} = 2.5 \qquad Z = 2.5$$

9b)

$$Z = \frac{y^2 + 4}{4 + y} \qquad y = -6$$

$$Z = \frac{(-6)^2 + 4}{4 + (-6)} = \frac{36 + 4}{4 - 6} = \frac{40}{-2} = -20$$

$$Z = -20$$

More Linear Equations   Exercise 5G

10)

$$5(x - 2) = 3(x + 4)$$
$$5x - 10 = 3x + 12$$
$$5x - 3x = +12 + 10$$
$$2x = 22$$
$$x = \frac{22}{2} \qquad \underline{x = 11}$$

12)

$$3(h - 6) = 2(5 - 2h)$$
$$3h - 18 = 10 - 4h$$
$$3h + 4h = 10 + 18$$
$$7h = 28$$
$$h = \frac{28}{7} \qquad \underline{h = 4}$$

14)

$$2(5c + 2) - 2c = 3(2c + 3) + 7$$
$$10c + 4 - 2c = 6c + 9 + 7$$
$$10c - 2c - 6c = +9 + 7 - 4$$
$$2c = 12$$

$$c = \frac{12}{2} \qquad \underline{c = 6}$$