1 (a) You are given that $5a(a-1) + pa + r = 5a^2 + 7a + 9$.

Find the values of p and r that make this an identity.

(a) $p =$ _____[2]

(b) Rearrange the following to make c the subject.

$5c + 6d = cn + 9d$

(b) _____ **[3]**

2 (a) Rearrange this formula to make p the subject.

$$t = 2p - 3$$

(a) _____ **[2]**

(b) Solve these simultaneous equations.

$$x + y = 7$$
$$x - y = {}^-3$$

(b) $x =$ _____ $y =$ _____ **[2]**

3   Rearrange to make *p* the subject.

$C + 5p = a(C - p)$

_____ **[4]**

4 **(a)** Rearrange this formula to make *a* the subject.

$5(a + b) = 2ab$

(a) .... **[4]**

(b) You are given that f(x) = 2x – 5.

    (i) Find f(3.5).

                                               (b)(i) .... **[1]**

    (ii) Express f(3x + 4) in the form $ax + b$.

                                               (ii) .... **[2]**

5 **(a)** Solve.

$6x^2 = 150$

(a) .... **[3]**

(b) Rearrange this formula to make *a* the subject.

$S = 4bc + 2a^2$

(b) .... **[3]**

6 **(a)** Find the values of *a* and *b* so that the following is an identity.

$2x + a(3x + 5) \equiv bx + 30$

(a) *a* = _____

b = _____ **[3]**

(b) Rearrange this formula to make *p* the subject.

$$H = \sqrt{\frac{10p^3}{c}}$$

(b) _____ **[4]**

7   **(a** Write a **number** in each box so that the following is an identity.

$$5x - 7(2x - 3) \equiv 6x + 3 - \boxed{}\, x + \boxed{}$$

[2]

(b) Solve this equation.

$$\frac{5x + 4}{2} = x - 1$$

(b) _____ **[3]**

(c) Solve this equation.

$x^2 = 81$

(c) _____ **[2]**

(d) Rearrange this formula to make p the subject.

$H = \sqrt{10p + c}$

(d) _____ **[3]**

8   (a Solve.

$$4x^2 = 36$$

(a) _____ **[3]**

(b) Rearrange this formula to make A the subject.

$$c = \sqrt{\frac{A}{6}}$$

(b) _____ **[2]**

9 **(a)** Solve.

$$5y^2 = 80$$

(a) .... **[3]**

(b) Rearrange this formula to make *a* the subject.

$$4a - 3c = ac + 6$$

(b) .... **[4]**
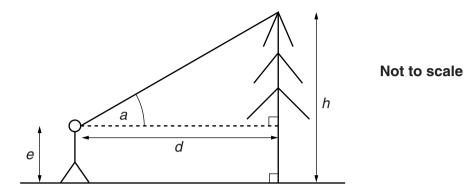
10 Pali wants to find the height, *h* m, of a tree.
He stands a distance, *d* m, from the tree.
Then he measures the angle, *a*, of the top of the tree from the horizontal.
His friend then measures the height, *e* m, of Pali's eye from the ground.

Not to scale

(a) Show that the height of the tree is given by this formula.

$h = e + d \tan a$ **[2]**

(b) When Pali stands 25 m from the tree, angle *a* = 32°.
The height of his eye above the ground is 1.7 m.

Use the formula $h = e + d \tan a$ to find the height of the tree.

(b) _____ m **[2]**

(c) Rearrange this formula to make *a* the subject.

$h = e + d \tan a$

(c) _____ **[3]**

11 **(a)** Rearrange the following to make *c* the subject.

$$11a + 5c = d(6 + 2c)$$

(a) _____ **[4]**

(b) f(x) = 5x − 12.

   (i) Calculate f(4).

(b)(i) _____ **[1]**

   (ii) Find f(x + 1). Give your answer in the form $ax + b$.

(ii) _____ **[2]**

12 **(a)** Rearrange this formula to make *r* the subject.

$$S = 4\pi r^2$$

(a) _____ [3]

(b) $f(x) = \dfrac{3}{4x + 6}$

    (i) Find f(1).

(b)(i) _____ [1]

    (ii) Explain why f(¯1.5) cannot be evaluated. [1]