10.11 Solving Quadratic Equations by Factorisation

1. Solve the following equations by factorisation.

   (a) $x^2 + 2x - 35 = 0$ (b) $x^2 - 15x - 54 = 0$

   (c) $x^2 - x - 90 = 0$ (d) $x^2 + 15x + 54 = 0$

   (e) $x^2 + 20x + 51 = 0$ (f) $x^2 - 12x + 32 = 0$

   (g) $x^2 - 24x + 143 = 0$ (h) $x^2 - 17x + 60 = 0$

   (i) $x^2 - 14x - 176 = 0$ (j) $x^2 - 26x + 133 = 0$

   (k) $x^2 + 7x - 44 = 0$ (l) $x^2 + 2x - 195 = 0$

   (m) $2x^2 - 5x + 3 = 0$ (n) $2x^2 - 7x - 9 = 0$

   (o) $2x^2 + 13x + 6 = 0$

2. Solve the following equations:

   (a) $x^2 - 6x + 8 = 0$ (b) $m^2 + 10m + 21 = 0$

   (c) $p^2 - 7p - 30 = 0$ (d) $x^2 - 7x + 12 = 0$

   (e) $x^2 - 9x + 20 = 0$ (f) $p^2 - 6p - 27 = 0$

   (g) $a^2 - a - 56 = 0$ (h) $q^2 - 6q - 16 = 0$

   (i) $2y^2 + 7y + 3 = 0$ (j) $6x^2 + x - 12 = 0$

   (k) $4m^2 + 7m - 2 = 0$ (l) $4z^2 + 4z - 15 = 0$

3. Find the solutions of each of the following equations:

   (a) $y^2 = y + 56$ (b) $12w^2 = 13w - 3$

   (c) $11y = -4 - 6y^2$ (d) $c(c - 1) = 2$

   (e) $q^2 = -2(q - 4)$ (f) $d(d + 2) = 3$

   (g) $x(x - 5) = 84$ (h) $y(5y + 27) = 18$

   (i) $3p^2 = 6p(2 + p)$ (j) $2x(4x + 5) = 3$

   (k) $13x = 2(2x^2 + 5)$ (l) $2(10 - x^2) = 3x$

   (m) $4y - 3 = 3y(y - 2)$ (n) $-12y - 9(y + 1) = 6y^2$

   (o) $(a + 4)(a - 2) = -5$ (p) $(3x - 4)(x - 4) = -5$

4. Solve the following equations:

   (a) $x^2 - 16 = 0$ (b) $x^2 = 49$

   (c) $4x^2 - 81 = 0$ (d) $9x^2 = 64$

5. Solve the following equations:

   (a) $q^2 - 6q = -9$ (b) $x^2 + 81 = 18x$ (c) $y^2 = 22y - 121$

   (d) $4(3x - 1) = 9x^2$ (e) $-25 = 4y(y - 5)$

6. Solve the following equations:

(a) $x^2 = 25$ (b) $a^2 = 36$ (c) $y^2 = \frac{49}{4}$

(d) $b^2 - 16 = 0$ (e) $a^2 - 64 = 0$ (f) $x^2 - \frac{4}{81} = 0$

(g) $4y^2 = 9$ (h) $2x^2 = 32$ (i) $3p^2 - 27 = 0$

(j) $5p^2 - 20 = 0$ (k) $25b^2 - 40 = 9$ (l) $3b^2 - 8 = 4$

7. The area of a parallelogram is 50 cm^2. If the base is twice its height, calculate the height.

8. The breadth of a rectangular plot of land is 5 m less than its length. If the area of the plot is 104 m^2, find the dimensions of the plot.

9. A circle has an area of 154 cm^2. Find its radius.

10. In a triangle, its base is 3 cm less than its height. If its area is 14 cm^2, find its height.

11. The area of a rectangle is 51 cm^2. Find the length and the breadth of this rectangle if their difference is 14 cm.

12. (a) Solve the equation $\frac{1}{2}x - 5 = \frac{1}{4}x + 3$

(b) (i) Factorise $x^2 + 5x - 14$

(ii) Hence solve the equation $x^2 + 5x - 14 = 0$

(AQA)

13. (a) Simplify the following expression.

$$\frac{x^2 + x - 2}{x^2 - 4}$$

(b) Solve

$$\frac{2x + 1}{x - 1} = \frac{7x + 3}{4x - 3}$$

(c) Solve $(x - 5)(x + 1) > 0$

(OCR)