

## Chapter 2 Quadratic Expressions and Equations

**A Form the quadratic expressions by multiply the following linear expressions.**

$$1. (x + 1)(x + 3) \\ =$$

$$2. (x + 2)(x + 4) \\ =$$

$$3. (n + 2)(n + 3) \\ =$$

$$4. (p - 2)(p + 3) \\ =$$

$$5. (x + 4)(x - 1) \\ =$$

$$6. (x - 4)(x + 3) \\ =$$

$$7. (x - 2)(x - 3) \\ =$$

$$8. (m - 2)(m - 5) \\ =$$

$$9. (x - 2)(x - 4) \\ =$$

$$10. (2x + 1)(x + 3) \\ =$$

$$11. (m + 4)(2m + 2) \\ =$$

$$12. (3x + 1)(x + 2) \\ =$$

$$13. (3p - 2)(p + 1) \\ =$$

$$14. (x - 4)(2x + 1) \\ =$$

$$15. (2x - 1)(x + 5) \\ =$$

$$16. (x - 5)(4x - 1) \\ =$$

$$17. (4x - 3)(x - 1) \\ =$$

$$18. (2h - 1)(2h - 1) \\ =$$

**B Factorise the following quadratic expressions.**

$$\begin{aligned}
 1. \quad & 2x^2 + 2 \\
 & = 2(x^2) + 2(1) \\
 & = 2(x^2 + 1)
 \end{aligned}$$

$$\begin{aligned}
 2. \quad & 2x^2 + 4 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 3. \quad & 4x^2 - x \\
 & = x(4x) - x(1) \\
 & = x(4x - 1)
 \end{aligned}$$

$$\begin{aligned}
 4. \quad & x^2 - 9 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 5. \quad & 4a^2 - 9 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 6. \quad & 5m^2 - 5 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 7. \quad & 3n^2 - 6 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 8. \quad & 3p^2 + p \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 9. \quad & h^2 - 16 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 10. \quad & 4b^2 - 1 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 11. \quad & x^2 + 3x + 2 \\
 & = (x + 1)(x + 2)
 \end{aligned}$$

$$\begin{aligned}
 12. \quad & x^2 + 5x - 6 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 13. \quad & x^2 + x - 2 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 14. \quad & x^2 - x - 6 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 15. \quad & x^2 - 5x + 6 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 16. \quad & x^2 - 6x + 8 \\
 & = (x - 4)(x - 2)
 \end{aligned}$$

$$\begin{array}{l}
 (x - 4) \nearrow \\
 (x - 2) \nwarrow
 \end{array}
 \begin{array}{|c|c|c|}
 \hline
 x & -4 & -4x \\
 \hline
 x & -2 & -2x \\
 \hline
 x^2 & +8 & -6x \\
 \hline
 \end{array}
 +$$

$$\begin{aligned}
 17. \quad & x^2 + 4x + 3 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 18. \quad & x^2 + 8x + 15 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 19. \quad & x^2 - 2x - 8 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 20. \quad & x^2 - 7x + 12 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 21. \quad & x^2 + 3x - 4 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 22. \quad & x^2 - 2x - 15 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 23. \quad & x^2 + 7x + 10 \\
 & =
 \end{aligned}$$

$$\begin{aligned}
 24. \quad & x^2 + 9x + 20 \\
 & =
 \end{aligned}$$

**C Express the following quadratic equation in general form,  $ax^2 + bx + c$ .**

1.  $2(3 - x^2) = 4x$

8.  $\frac{4x - 2}{7x} = x$

14.  $(3 - 7x)^2 = 1$

2.  $4x(x - 2) = 5$

9.  $\frac{2n^2 + 5n}{n + 1} = 2$

15.  $9x(2x - 1) = 10$

3.  $p(p + 1) - 12 = 0$

10.  $\frac{5k + 2}{3} = k^2$

16.  $2x^2 = (3 - x)^2$

4.  $5 - 23x = x + 5x^2$

11.  $x^2 - x - 2 = 4(x - 2)$

17.  $\frac{(x + 2)^2}{5} = \frac{1}{4}$

5.  $3y^2 = 2(y - 1) + 7$

12.  $(2p + 1)(2p + 2) = 6$

6.  $(y - 4)^2 = 2y - 5$

18.  $3 + 2x = 7x^2 - 9x$

7.  $(x - 5)^2 = 9$

13.  $\frac{1}{2}(4x + 6) = 2x^2$

**D Solve the following quadratic equations.**

1.  $x^2 + 6x + 8 = 0$

6.  $x^2 - 6x + 8 = 0$

11.  $2x^2 + 3x - 2 = 0$

2.  $x^2 + 6x + 5 = 0$

7.  $n^2 + 15 = 8n$

12.  $x^2 - x = 12$

3.  $m^2 + 5m = -6$

8.  $2x^2 + 5x - 3 = 0$

13.  $\frac{n^2 + 20}{3} = 3n$

4.  $x^2 + 3x - 4 = 0$

9.  $2x^2 + 3x + 1 = 0$

14.  $p^2 = \frac{3p}{2} + 1$

5.  $p^2 = 6 - p$

10.  $2x^2 - x - 1 = 0$

15.  $x^2 = \frac{5x - 3}{2}$