Solving quadratic equations

6 questions | 17 marks

Award the shown method marks for equivalent correct working.

1. Solve $x^2 = 49$. [2 marks]

Give 7 [1] and -7 [1].
Answer: $x = 7$ or $x = -7$.

2. Solve $x^2 - 9x = 0$. [3 marks]

Factorise to $x(x - 9) = 0$ [1].
Use the zero-product rule to give $x = 0$ [1] and $x = 9$ [1].
Answer: $x = 0$ or $x = 9$.

3. Solve $x^2 + 7x + 10 = 0$. [3 marks]

Factorise to $(x + 5)(x + 2) = 0$ [1].
Give $x = -5$ [1] and $x = -2$ [1].
Answer: $x = -5$ or $x = -2$.

4. Solve $x^2 - 2x - 15 = 0$. [3 marks]

Factorise to $(x - 5)(x + 3) = 0$ [1].
Give $x = 5$ [1] and $x = -3$ [1].
Answer: $x = 5$ or $x = -3$.

5. Solve $x^2 - 8x + 16 = 0$. How many different roots are there? [3 marks]

Factorise to $(x - 4)^2 = 0$ [1].
Give $x = 4$ [1] and explain that both factors give the same root [1].
Answer: $x = 4$. There is one distinct root.

6. A square has area 64 cm^2. Its side length is s cm. Write and solve an equation to find s. [3 marks]

Write $s^2 = 64$ [1].
Find the positive square root $s = 8$, or give the algebraic roots $s = 8$ and $s = -8$ [1].
Choose the positive length and state 8 cm [1].
Answer: $s^2 = 64$, so the side length is 8 cm.