Quadratic Formula and Completing the Square

GCSE Mathematics • **Higher Tier** • Grades 8–9 • Non-calculator

Name: _____ Class: _____ Total: _____ / 61

Show all your working. Marks are given for correct method as well as the final answer.

1. Write down a, b and c for $2x^2 + 5x - 3 = 0$. **[2 marks]**

Answer: _____

2. Write down a, b and c for $x^2 - 4x + 1 = 0$. **[2 marks]**

Answer: _____

3. Write down the quadratic formula. **[1 mark]**

Answer: _____

4. Work out the discriminant of $x^2 + 3x + 1 = 0$. **[2 marks]**

Answer: _____

5. Work out the discriminant of $x^2 - 6x + 9 = 0$ and say what it tells you. **[3 marks]**

Answer: _____

6. Work out the discriminant of $x^2 + x + 4 = 0$ and say what it tells you. **[3 marks]**

Answer: _____

7. Solve $x^2 + 5x + 3 = 0$ using the formula, to 2 d.p. **[4 marks]**

Answer: _____

8. Solve $2x^2 - 3x - 4 = 0$ using the formula, to 2 d.p. **[4 marks]**

Answer: _____

9. Solve $x^2 - 4x - 1 = 0$, giving your answers in surd form. **[4 marks]**

Answer: _____

10. Solve $3x^2 + 2x - 2 = 0$, giving answers to 2 d.p. **[4 marks]**

Answer: _____

11. Write $x^2 + 6x$ in the form $(x + a)^2 - b$. **[2 marks]**

Answer: _____

12. Write $x^2 + 8x + 3$ in the form $(x + a)^2 + b$. **[3 marks]**

Answer: _____

13. Write $x^2 - 10x + 2$ in completed square form. **[3 marks]**

Answer: _____

14. Write $x^2 - 3x + 1$ in completed square form. **[3 marks]**

Answer: _____

15. Write $2x^2 + 12x + 5$ in the form $a(x + b)^2 + c$. **[4 marks]**

Answer: _____

16. The curve $y = (x - 4)^2 + 3$ has a minimum. Write down its coordinates. **[2 marks]**

Answer: _____

17. Write down the minimum value of $(x + 2)^2 - 7$ and the x value where it occurs. **[2 marks]**

Answer: _____

18. Write $x^2 + 4x + 9$ in completed square form and hence explain why it is always positive. **[4 marks]**

Answer: _____

19. Solve $x^2 + 6x + 4 = 0$ by completing the square, giving your answers in surd form. **[4 marks]**

Answer: _____

20. A curve has equation $y = x^2 - 8x + 11$.

(a) Write it in completed square form. **[3 marks]**

(b) Write down the coordinates of the turning point. **[2 marks]**

Answer: _____

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