Expanding and Factorising Quadratics

GCSE Mathematics • **Higher Tier** • Grades 4–7 • Non-calculator

Name: ..... Class: ..... Total: ..... / 66

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

1. Expand and simplify $(x + 4)(x + 6)$. **[2 marks]**

Answer: .....

2. Expand and simplify $(2y - 5)(y + 7)$. **[2 marks]**

Answer: .....

3. Expand and simplify $(x - 3)^2$. **[2 marks]**

Answer: .....

4. Expand and simplify $(3x + 2)^2$. **[3 marks]**

Answer: .....

5. Factorise fully $x^2 - 49$. **[1 mark]**

Answer: .....

6. Factorise fully $9x^2 - 25$. **[2 marks]**

Answer: .....

7. Factorise fully $4x^2 - 81$. **[2 marks]**

Answer: .....

8. Factorise $x^2 - 3x - 28$. **[2 marks]**

Answer: .....

9. Factorise $x^2 - 11x + 24$. **[2 marks]**

Answer: .....

10. Factorise fully $2x^2 + 10x$. **[2 marks]**

Answer: .....

11. Factorise fully $3x^2 - 27$. **[3 marks]**

Answer: .....

12. Solve $x^2 - 5x - 14 = 0$. **[3 marks]**

Answer: .....

13. Factorise $6x^2 + 11x - 10$. **[3 marks]**

Answer: .....

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

Answer: .....

15. Solve $3x^2 - 10x + 8 = 0$. **[4 marks]**

Answer: .....

16. Expand and simplify $(x + 5)(x - 5)(x + 1)$. **[3 marks]**

Answer: .....

17. Simplify fully $\dfrac{x^2-9}{x^2+7x+12}$. **[3 marks]**

Answer: .....

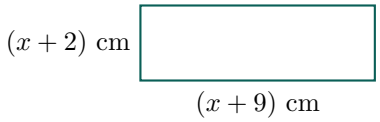
18. Solve $x^2 = 9x$. **[3 marks]**

Answer: .....

19. $(x+a)(x+b) = x^2+9x+18$, where a and b are positive integers and $a > b$. Find a and b. **[3 marks]**

Answer: .....

20. A rectangle has width $(x+2)$ cm and length $(x+9)$ cm. Its area is 60 cm^2.



(a) Show that $x^2 + 11x - 42 = 0$. **[2 marks]**

(b) Find the width, explaining why you reject one solution. **[4 marks]**

Answer: ..... **cm**

21. Two consecutive positive integers multiply to give 156.

(a) Letting the smaller be n, show that $n^2 + n - 156 = 0$. **[2 marks]**

(b) Find the two integers. **[4 marks]**

Answer: .....

22. A triangle has base $(x + 3)$ cm and height $(x - 1)$ cm. Its area is 30 cm^2.

(a) Show that $x^2 + 2x - 63 = 0$. **[3 marks]**

(b) Find the base of the triangle. **[3 marks]**

Answer: .....