PLOTTING QUADRATICS

Answer all of these questions. Remember to show your working out in all questions.

MAIN QUESTIONS

1. Factorise $x^2 + 5x + 6$ | $(x+2)(x+3)$

2. Factorise $x^2 - 4x - 5$ | $(x-5)(x+1)$

3. Solve $x^2 + 6x + 8 = 0$ | $x=-2$ or $x=-4$

4. Solve $2x^2 - 7x + 3 = 0$ | $x=3$ or $x=0.5$

5. Find roots of $3x^2 + 2x - 1 = 0$ | $x=[-1\pm\sqrt{7}]/3$

6. Find roots of $x^2 - 3x + 1 = 0$ | $x=[3\pm\sqrt{5}]/2$

7. Solve $4x^2 - 12x + 9 = 0$ | $x=1.5$

8. Solve $5x^2 + 3x - 2 = 0$ | $x=0.4$ or $x=-1$

9. Complete square: $x^2 - 2x - 3$ | $(x-1)^2 - 4$

10. Complete square: $x^2 + 8x + 5$ | $(x+4)^2 - 11$

11. Complete square: $2x^2 - 4x + 1$ | $2(x-1)^2 - 1$

12. Complete square: $3x^2 + 12x - 4$ | $3(x+2)^2 - 16$

13. Complete square: $-x^2 + 6x - 2$ | $-(x-3)^2 + 7$

14. Find vertex of $y = x^2 - 6x + 8$ | $(3, -1)$

15. Find vertex of $y = -x^2 + 4x + 1$ | $(2, 5)$

16. Find vertex of $y = 2x^2 + 8x - 3$ | $(-2, -11)$

17. Find axis of symmetry for $y = x^2 + 10x - 3$ | $x=-5$

18. Find axis of symmetry for $y = -3x^2 + 6x + 2$ | $x=1$

19. Find y-intercept of $y = 4x^2 - 3x + 7$ | $(0,7)$

20. State if $y = 5x^2 - 2x + 1$ has max or min | minimum

21. State if $y = -2x^2 + x - 4$ has max or min | maximum

22. Find minimum value of $y = x^2 - 4x + 10$ | 6

23. Find maximum value of $y = -x^2 - 6x + 3$ | 12

24. Find roots of $0.5x^2 + 2x - 4 = 0$ | $x=-4\pm2\sqrt{6}$

25. Solve $1.2x^2 - 3.6x + 1.8 = 0$ | $x=1.5$ or $x=1$

MASTER QUESTIONS

M1. A rectangle has area $24cm^2$ with length 2cm more than width. Find dimensions. | 6cm by 4cm

M2. The product of two consecutive integers is 72. Find both pairs. | 8 and 9 or -9 and -8

M3. A ball's height h metres after t seconds is $h = 20t - 5t^2$. Find maximum height. | 20 metres

M4. A shop's daily profit £P from selling x items is $P = -2x^2 + 80x$. Find items for maximum profit. | 20 items

M5. A field's area is $300m^2$ with one side 10m longer than the other. Find the dimensions. | 15m by 20m