Solving Quadratic Equations

Exercise A

Solve the following equations.

1. $x^2 + 7x + 12 = 0$	**2.** $x^2 + 7x + 10 = 0$	**3.** $x^2 + 2x - 15 = 0$
4. $x^2 + x - 6 = 0$	**5.** $x^2 - 8x + 12 = 0$	**6.** $x^2 + 10x + 21 = 0$
7. $x^2 - 5x + 6 = 0$	**8.** $x^2 - 4x - 5 = 0$	**9.** $x^2 + 5x - 14 = 0$
10. $2x^2 - 3x - 2 = 0$	**11.** $3x^2 + 10x - 8 = 0$	**12.** $2x^2 + 7x - 15 = 0$
13. $6x^2 - 13x + 6 = 0$	**14.** $4x^2 - 29x + 7 = 0$	**15.** $10x^2 - x - 3 = 0$
16. $y^2 - 15y + 56 = 0$	**17.** $12y^2 - 16y + 5 = 0$	**18.** $y^2 + 2y - 63 = 0$
19. $x^2 + 2x + 1 = 0$	**20.** $x^2 - 6x + 9 = 0$	**21.** $x^2 + 10x + 25 = 0$
22. $x^2 - 14x + 49 = 0$	**23.** $6a^2 - a - 1 = 0$	**24.** $4a^2 - 3a - 10 = 0$
25. $z^2 - 8z - 65 = 0$	**26.** $6x^2 + 17x - 3 = 0$	**27.** $10k^2 + 19k - 2 = 0$
28. $y^2 - 2y + 1 = 0$	**29.** $36x^2 + x - 2 = 0$	**30.** $20x^2 - 7x - 3 = 0$
†**31.** $x^4 - 5x^2 + 4 = 0$	†**32.** $x^4 - 13x^2 + 36 = 0$	
†**33.** $4x^4 - 17x^2 + 4 = 0$	†**34.** $x^6 - 9x^3 + 8 = 0$	

Exercise B

Solve the following equations.

1. $x^2 - 3x = 0$	**2.** $x^2 + 7x = 0$	**3.** $2x^2 - 2x = 0$	**4.** $3x^2 - x = 0$
5. $x^2 - 16 = 0$	**6.** $x^2 - 49 = 0$	**7.** $4x^2 - 1 = 0$	**8.** $9x^2 - 4 = 0$
9. $6y^2 + 9y = 0$	**10.** $6a^2 - 9a = 0$	**11.** $10x^2 - 55x = 0$	**12.** $16x^2 - 1 = 0$
13. $y^2 - \frac{1}{4} = 0$	**14.** $56x^2 - 35x = 0$	**15.** $36x^2 - 3x = 0$	**16.** $x^2 = 6x$
17. $x^2 = 11x$	**18.** $2x^2 = 3x$	**19.** $x^2 = x$	**20.** $4x = x^2$

Exercise C

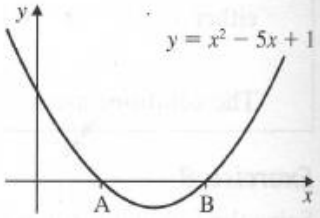
Solve the following, giving answers to two decimal places where necessary.

1. $2x^2 + 11x + 5 = 0$	**2.** $3x^2 + 11x + 6 = 0$	**3.** $6x^2 + 7x + 2 = 0$
4. $3x^2 - 10x + 3 = 0$	**5.** $5x^2 - 7x + 2 = 0$	**6.** $6x^2 - 11x + 3 = 0$
7. $2x^2 + 6x + 3 = 0$	**8.** $x^2 + 4x + 1 = 0$	**9.** $5x^2 - 5x + 1 = 0$
10. $x^2 - 7x + 2 = 0$	**11.** $2x^2 + 5x - 1 = 0$	**12.** $3x^2 + x - 3 = 0$
13. $3x^2 + 8x - 6 = 0$	**14.** $3x^2 - 7x - 20 = 0$	**15.** $2x^2 - 7x - 15 = 0$
16. $x^2 - 3x - 2 = 0$	**17.** $2x^2 + 6x - 1 = 0$	**18.** $6x^2 - 11x - 7 = 0$
19. $3x^2 + 25x + 8 = 0$	**20.** $3y^2 - 2y - 5 = 0$	**21.** $2y^2 - 5y + 1 = 0$
22. $\frac{1}{2}y^2 + 3y + 1 = 0$	**23.** $2 - x - 6x^2 = 0$	**24.** $3 + 4x - 2x^2 = 0$

25. (a) To find the x-coordinate of A and B, solve the equation

$$x^2 - 5x + 1 = 0$$

(b) Explain why the equation $x^2 - 5x + 10 = 0$ has no solutions.



Exercise D

Solve the following, giving answers to two decimal places where necessary.

1. $x^2 = 6 - x$

2. $x(x + 10) = -21$

3. $3x + 2 = 2x^2$

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

5. $6x(x + 1) = 5 - x$

6. $(2x)^2 = x(x - 14) - 5$

7. $(x - 3)^2 = 10$

8. $(x + 1)^2 - 10 = 2x(x - 2)$

9. $(2x - 1)^2 = (x - 1)^2 + 8$

10. $3x(x + 2) - x(x - 2) + 6 = 0$

11. $x = \frac{15}{x} - 22$

12. $x + 5 = \frac{14}{x}$

13. $4x + \frac{7}{x} = 29$

14. $10x = 1 + \frac{3}{x}$

15. $2x^2 = 7x$

16. $16 = \frac{1}{x^2}$

17. $2x + 2 = \frac{7}{x} - 1$

18. $\frac{2}{x} + \frac{2}{x+1} = 3$

19. $\frac{3}{x-1} + \frac{3}{x+1} = 4$

20. $\frac{2}{x-2} + \frac{4}{x+1} = 3$

21. Hassan says you can make it easier to solve some equations by dividing through by a common factor.
So, by dividing through by 2, the equation $2x^2 + 10x - 48 = 0$ can be written as $x^2 + 5x - 24 = 0$
Is this OK?
Check by solving the two equations above.
Are the solutions the same?

22. Solve the equations:
(a) $4x^2 - 10x - 6 = 0$ (b) $3x^2 - 6x - 72 = 0$