

**Algebra & Functions (Maths 201-016)****Solving quadratic equations**

Solve using the quadratic formula.

If necessary, expand the following expressions and collect like terms.

1. $x^2 + 6x - 16 = 0$

2. $2x^2 - 2x - 4 = 0$

3. $2x^2 + 3x - 1 = 0$

4. $9x^2 - 12x + 4 = 0$

5. $3x^2 + 4x + 5 = 0$

6. $4x^2 + 3x = 1$

7. $2x^2 = 4x - 5$

8. $2(x^2 + 3x) = x^2 - 6$

9. $2x^2 + x - 1 = 3x$

Solve by completing the square.

10. $x^2 - 8x - 20 = 0$

11. $x^2 + 6x - 31 = 0$

12. $x^2 - 10x + 9 = 0$

13. $x^2 - 8x + 7 = 0$

14. $x^2 - 4x + 8 = 0$

15. $x^2 + 12x = 0$

16. $x^2 - 6 = 3x$

17. $x^2 - 24 = 10x$

18. $x^2 = 6x + 7$

19. $x^2 + 4x + 13 = 0$

Solve by taking square roots.

20. $(x - 1)^2 = 9$

21. $(2x + 1)^2 = 100$

22. $(1 - 2x)^2 + 13 = 0$

23. $16 = (3x - 5)^2$

24. $4(2x + 3)^2 = 9$

25. $25(x + 1)^2 = 1$

26. $4(2x + 4)^2 = 32$

27. $27 - 3(1 - x)^2 = 0$

28. $-2(2x - 3)^2 + 18 = 0$

29. $16(x - \frac{3}{4})^2 - 25 = 0$

30. $\frac{1}{9}(2x + 1)^2 = 1$

31. $\frac{1}{2}(x + 1)^2 = 32$

32. $-64 - 49(4 - x)^2 = 0$

33. $\frac{1}{4}(x - 7)^2 - 30 = -5$

34. $17 - \frac{1}{3}(3x + 1)^2 = \frac{2}{3}$

Solve using the method of your choice.

35. $x^2 - 3x - 18 = 0$

36. $100x^2 + 1200x + 3200 = 0$

37. $x^2 - 6x - 7 = 0$

38. $x^2 = x$

39. $36(4x - 3)^2 = 25$

40. $9x^2 - 18x - 27 = 0$

41. $16x^2 + 8x + 1 = 0$

42. $x^2 - 81 = 0$

43. $2x^2 - 4x + 5 = 0$

44. $x^4 + 12x^3 + 35x^2 = 0$

Answers

1. $2, -8$
2. $2, -1$
3. $\frac{-3 \pm \sqrt{17}}{4}$
4. $\frac{2}{3}$
5. No solution.
6. $-1, \frac{1}{4}$
7. No solution.
8. $-3 \pm \sqrt{3}$
9. $\frac{1 \pm \sqrt{3}}{2}$
10. $10, -2$
11. $-3 \pm 2\sqrt{10}$
12. $1, 9$
13. $1, 7$
14. No solution.
15. $0, -12$
16. $\frac{3 \pm \sqrt{33}}{2}$
17. $12, -2$
18. $7, -1$
19. No solution.
20. $4, -2$
21. $\frac{9}{2}, -\frac{11}{2}$
22. No solution.
23. $3, \frac{1}{3}$
24. $-\frac{3}{4}, -\frac{9}{4}$
25. $-\frac{4}{5}, -\frac{6}{5}$
26. $-2 \pm \sqrt{2}$
27. $-2, 4$
28. $0, 3$
29. $2, -\frac{1}{2}$
30. $-2, 1$
31. $7, -9$
32. No solution.
33. $17, -3$
34. $2, -\frac{8}{3}$
35. $6, -3$
36. $-8, -4$
37. $7, -1$
38. $0, 1$
39. $\frac{23}{24}, \frac{13}{24}$
40. $3, -1$
41. $-\frac{1}{4}$
42. ± 9
43. No solution.
44. $0, -5, -7$