

Key

Solving Quadratic Equations

Solve using the quadratic formula.

1. $x^2 - 7x = 44$ $x^2 - 7x - 44 = 0$

$$x = \frac{-(-7) \pm \sqrt{(-7)^2 - 4(1)(-44)}}{2(1)}$$

$$x = \frac{7 \pm \sqrt{49 + 176}}{2}$$

$$x = \frac{7 \pm \sqrt{225}}{2} \quad x = \frac{7 \pm 15}{2}$$

$x = 11$ OR $x = -4$

2. $12x^2 + 5x - 2 = 0$

$$x = \frac{-5 \pm \sqrt{(5)^2 - 4(12)(-2)}}{2(12)}$$

$$x = \frac{-5 \pm \sqrt{25 + 96}}{24}$$

$$x = \frac{-5 \pm \sqrt{121}}{24} \rightarrow x = \frac{-5 \pm 11}{24}$$

$x = \frac{1}{4}$ OR $x = -\frac{3}{4}$

3. $x^2 - 225 = 0$

$$x = \frac{-0 \pm \sqrt{0^2 - 4(1)(-225)}}{2(1)}$$

$$x = \frac{0 \pm \sqrt{900}}{2}$$

$$x = \pm \frac{30}{2}$$

$x = \pm 15$

4. $8x^2 + 6x - 5 = 0$

$$x = \frac{-6 \pm \sqrt{36 - 4(8)(-5)}}{2(8)}$$

$$x = \frac{-6 \pm \sqrt{196}}{16} \quad x = \frac{-6 \pm 14}{16}$$

$x = \frac{1}{2}$ OR $x = -\frac{5}{4}$

Find the number of real solutions of each equation using the discriminant.

5. $3x^2 + 10x + 6 = 0$
 $(10)^2 - 4(3)(6)$
 $100 - 72$
 28

6. $4x^2 + x + 6 = 0$
 $(1)^2 - 4(4)(6)$
 $1 - 96$
 -95

7. $4x^2 + 4x + 1 = 0$
 $(4)^2 - 4(4)(1)$
 $16 - 16$
 0

Two Real

No Real

One Real

Solve using any method. Explain why you chose the method you used.

8. $x^2 + x + 3 = 0$
 It's not factorable.
 B is 1 so use quad. formula

$$\frac{-1 \pm \sqrt{1^2 - 4(1)(3)}}{2(1)}$$

$$\frac{-1 \pm \sqrt{1 - 12}}{2}$$

No Real Solution

9. $2x^2 + 3x - 20 = 0$
 It is Factorable +
 #s are not too big →
 can see it easily.

$$2x^2 + 8x - 5x - 20 = 0$$

$$2x(x+4) - 5(x+4) = 0$$

$$(2x-5)(x+4) = 0$$

$x = -4$ OR $x = \frac{5}{2}$

There's a back !

10. $3x^2 - 108 = 0$

B is equal to zero so I can easily use the square root method

$3x^2 = 108$

$x^2 = 36$

$x = \pm 6$

11. $9x^2 - 12x + 4 = 0$

factor because it is a perfect square trinomial.

$\sqrt{(3x-2)^2} = \sqrt{0}$

$3x - 2 = 0$

$x = \frac{2}{3}$

12. $4x^2 = 64$

B is equal to zero so I can use the square root method

$x^2 = 16$

$x = \pm 4$

13. $4(x-3)^2 = 25$

B is equal to zero so I can use the square root method.

$\sqrt{(x-3)^2} = \sqrt{\frac{25}{4}}$

$x-3 = \pm \frac{5}{2}$

$x = 3 \pm 2.5$

$x = 5.5$ or $x = 0.5$

14. $x^2 - 3x - 28 = 0$

Easily factorable
Not many factors of 28

$(x-7)(x+4) = 0$

$x = 7$ or $x = -4$

15. $x^2 - x = 6$ $x^2 - x - 6 = 0$

I can see the factored form easily, $a = 1$

$(x-3)(x+2) = 0$

$x = 3$ or $x = -2$

16. $2x^2 - 4x - 3 = 0$

Not factorable -
QUAD FORMULA is easier than completing the square

$\frac{4 \pm \sqrt{(-4)^2 - 4(2)(-3)}}{2(2)}$

$\frac{4 \pm \sqrt{16+24}}{4}$

$\frac{4 \pm \sqrt{40}}{4}$

$x = \frac{4 \pm 2\sqrt{10}}{4}$

$x = 1 \pm \frac{1}{2}\sqrt{10}$

17. $x^2 + 10x - 3 = 0$

B is an even value so I can complete the square easily.

$x^2 + 10x + \boxed{25} = 3 + \boxed{25}$

$(x+5)^2 = 28$

$x+5 = \pm \sqrt{28}$

$x = -5 \pm 2\sqrt{7}$ There's a back!

18. $\frac{1}{2}x^2 = \frac{1}{8}$

B is equal to zero so I can use the square root method.

$x^2 = \frac{2}{8}$
 $\sqrt{x^2} = \sqrt{\frac{1}{4}}$
 $x = \pm \frac{1}{2}$

19. $2x^2 - 15x - 8 = 0$

Factoring because I can see the factors quickly.

$2x^2 - 16x + x - 8 = 0$
 $2x(x-8) + 1(x-8) = 0$
 $(2x+1)(x-8) = 0$
 $x = 8$ $x = -\frac{1}{2}$

