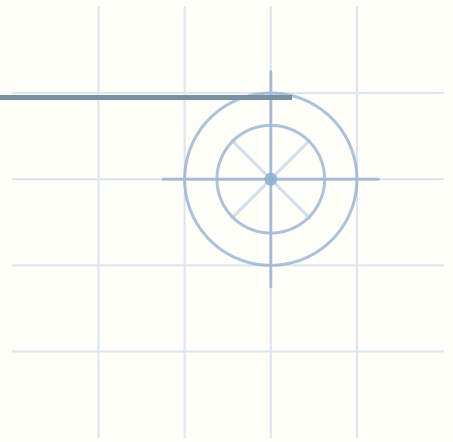


Solve by square roots — Square and shifted forms

Name: _____

Date: _____

Solve each equation by taking square roots.



1 $(x - 5)^2 = 16$

$$x - 5 = \pm 4$$

$$x = 5 \pm 4$$

$$x = 9 \text{ or } x = 1$$

2 $3x^2 = 243$

3 $(x - 9)^2 = 25$

4 $x^2 = 64$

5 $(x + 9)^2 = 25$

6 $(x - 3)^2 = 25$

7 $x^2 = 100$

8 $8x^2 = 288$

9 $x^2 = 9$

10 $(x + 9)^2 = 100$

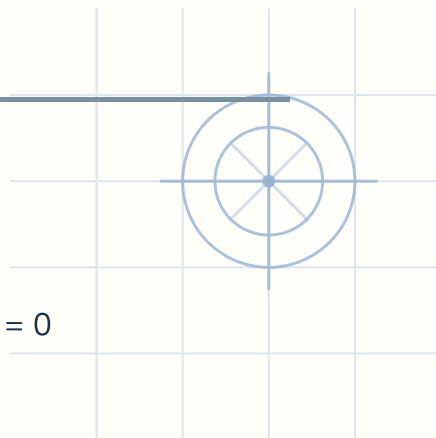


Solving quadratics — Already factored

Name: _____

Date: _____

Each product is zero. Write the two values of x .



1 $(x + 8)(x - 14) = 0$
 $x + 8 = 0$ or $x - 14 = 0$
 $x + 8 = 0 \rightarrow x = -8$
 $x - 14 = 0 \rightarrow x = 14$
 $x = -8$ or $x = 14$

2 $(x + 5)(x + 1) = 0$

3 $(x - 2)(x - 12) = 0$

4 $(x + 5)(x + 19) = 0$

5 $(x - 20)(x - 16) = 0$

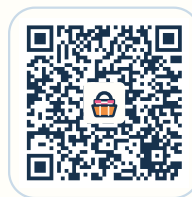
6 $(x + 6)(x + 20) = 0$

7 $(x + 15)(x - 20) = 0$

8 $(x - 13)(x + 20) = 0$

9 $(x + 2)(x - 1) = 0$

10 $(x - 11)(x - 15) = 0$

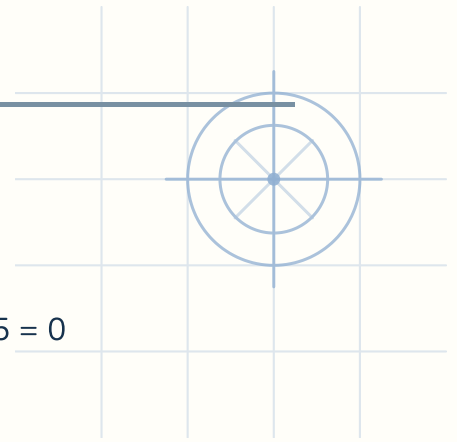


Solving quadratics — Factor it first

Name: _____

Date: _____

Factor first, then solve. Write the two values of x .



1 $x^2 + 26x + 153 = 0$
 $(x + 9)(x + 17) = 0$
 $x + 9 = 0$ or $x + 17 = 0$
 $x + 9 = 0 \rightarrow x = -9$
 $x + 17 = 0 \rightarrow x = -17$
 $x = -9$ or $x = -17$

2 $x^2 - 12x + 35 = 0$

3 $x^2 + 11x - 42 = 0$

4 $x^2 + 19x + 84 = 0$

5 $x^2 + 33x + 266 = 0$

6 $x^2 + 5x - 14 = 0$

7 $x^2 + 8x - 9 = 0$

8 $x^2 - 18x + 77 = 0$

9 $x^2 + 21x + 80 = 0$

10 $x^2 - 23x + 102 = 0$

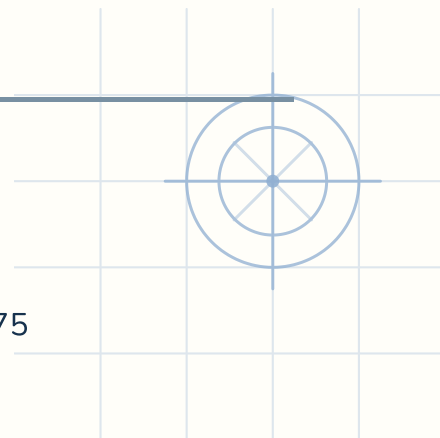


Solving quadratics — Not equal to zero yet

Name: _____

Date: _____

Make one side zero first, then solve.



1 $x^2 + 24x = -135$

$$x^2 + 24x + 135 = 0$$

$$(x + 9)(x + 15) = 0$$

$$x + 9 = 0 \text{ or } x + 15 = 0$$

$$x + 9 = 0 \rightarrow x = -9$$

$$x + 15 = 0 \rightarrow x = -15$$

$$x = -9 \text{ or } x = -15$$

2 $x^2 - 20x = -75$

3 $x^2 + 7x = 198$

4 $x^2 - 9x = 112$

5 $x^2 - 16x = -28$

6 $x^2 + 2x = 323$

7 $x^2 + 3x = 54$

8 $x^2 + 12x = -32$

9 $x^2 - 20x = -91$

10 $x^2 + 21x = -68$

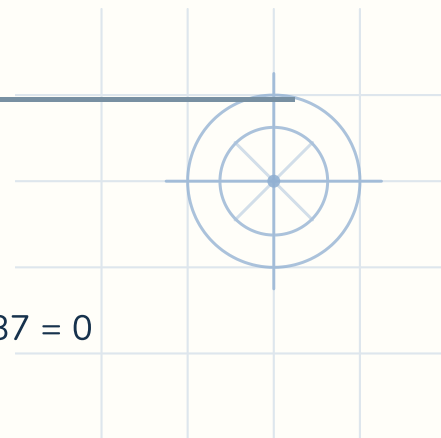


How many real solutions — X^2 on its own

Name: _____

Date: _____

How many real solutions does each equation have? Circle one.



1 $x^2 + 13x + 155 = 0$

$a = 1, b = 13, c = 155$

$b^2 - 4ac = 13^2 - 4(1)(155)$

$= -451 < 0 \rightarrow \text{none}$

2 $x^2 - 15x + 87 = 0$

3 $x^2 - 3x - 144 = 0$

4 $x^2 - 27x - 119 = 0$

5 $x^2 - 2x + 28 = 0$

6 $x^2 - 33x + 6 = 0$

7 $x^2 + 3x + 128 = 0$

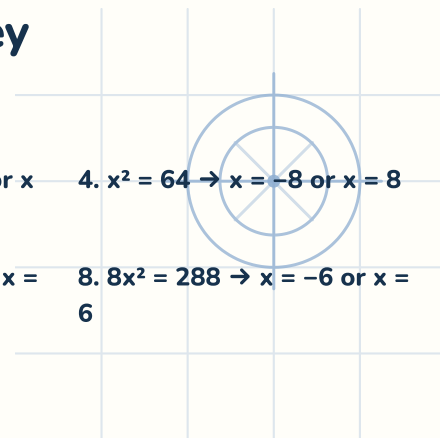
8 $x^2 - 14x + 49 = 0$

9 $x^2 - 20x + 100 = 0$

10 $x^2 + 10x + 25 = 0$



Power Pack · Quadratic equations — Answer key



By square roots

1. $(x - 5)^2 = 16 \rightarrow x = 1$ or $x = 9$

2. $3x^2 = 243 \rightarrow x = -9$ or $x = 9$

3. $(x - 9)^2 = 25 \rightarrow x = 4$ or $x = 14$

4. $x^2 = 64 \rightarrow x = -8$ or $x = 8$

5. $(x + 9)^2 = 25 \rightarrow x = -14$
or $x = -4$

6. $(x - 3)^2 = 25 \rightarrow x = -2$ or $x = 8$

7. $x^2 = 100 \rightarrow x = -10$ or $x = 10$

8. $8x^2 = 288 \rightarrow x = -6$ or $x = 6$

9. $x^2 = 9 \rightarrow x = -3$ or $x = 3$

10. $(x + 9)^2 = 100 \rightarrow x = -19$
or $x = 1$

Already factored

1. $(x + 8)(x - 14) = 0 \rightarrow (x + 8)(x - 14) = 0 \rightarrow x = -8$ or $x = 14$

2. $(x + 5)(x + 1) = 0 \rightarrow (x + 5)(x + 1) = 0 \rightarrow x = -5$ or $x = -1$

3. $(x - 2)(x - 12) = 0 \rightarrow (x - 2)(x - 12) = 0 \rightarrow x = 2$ or $x = 12$

4. $(x + 5)(x + 19) = 0 \rightarrow (x + 5)(x + 19) = 0 \rightarrow x = -5$ or $x = -19$

5. $(x - 20)(x - 16) = 0 \rightarrow (x - 20)(x - 16) = 0 \rightarrow x = 20$
or $x = 16$

6. $(x + 6)(x + 20) = 0 \rightarrow (x + 6)(x + 20) = 0 \rightarrow x = -6$ or $x = -20$

7. $(x + 15)(x - 20) = 0 \rightarrow (x + 15)(x - 20) = 0 \rightarrow x = -15$
or $x = 20$

8. $(x - 13)(x + 20) = 0 \rightarrow (x - 13)(x + 20) = 0 \rightarrow x = 13$
or $x = -20$

9. $(x + 2)(x - 1) = 0 \rightarrow (x + 2)(x - 1) = 0 \rightarrow x = -2$ or $x = 1$

10. $(x - 11)(x - 15) = 0 \rightarrow (x - 11)(x - 15) = 0 \rightarrow x = 11$ or $x = 15$

Standard form

1. $x^2 + 26x + 153 = 0 \rightarrow (x + 9)(x + 17) = 0 \rightarrow x = -9$ or $x = -17$

2. $x^2 - 12x + 35 = 0 \rightarrow (x - 5)(x - 7) = 0 \rightarrow x = 5$ or $x = 7$

3. $x^2 + 11x - 42 = 0 \rightarrow (x + 14)(x - 3) = 0 \rightarrow x = -14$ or $x = 3$

4. $x^2 + 19x + 84 = 0 \rightarrow (x + 12)(x + 7) = 0 \rightarrow x = -12$ or $x = -7$

5. $x^2 + 33x + 266 = 0 \rightarrow (x + 19)(x + 14) = 0 \rightarrow x = -19$
or $x = -14$

6. $x^2 + 5x - 14 = 0 \rightarrow (x - 2)(x + 7) = 0 \rightarrow x = 2$ or $x = -7$

7. $x^2 + 8x - 9 = 0 \rightarrow (x + 9)(x - 1) = 0 \rightarrow x = -9$ or $x = 1$

8. $x^2 - 18x + 77 = 0 \rightarrow (x - 7)(x - 11) = 0 \rightarrow x = 7$ or $x = 11$

9. $x^2 + 21x + 80 = 0 \rightarrow (x + 16)(x + 5) = 0 \rightarrow x = -16$ or $x = -5$

10. $x^2 - 23x + 102 = 0 \rightarrow (x - 17)(x - 6) = 0 \rightarrow x = 17$ or $x = 6$

Rearrange, then solve

1. $x^2 + 24x = -135 \rightarrow (x + 9)(x + 15) = 0 \rightarrow x = -9$ or $x = -15$

2. $x^2 - 20x = -75 \rightarrow (x - 15)(x - 5) = 0 \rightarrow x = 15$ or $x = 5$

3. $x^2 + 7x = 198 \rightarrow (x + 11)(x + 18) = 0 \rightarrow x = -11$ or $x = -18$

4. $x^2 - 9x = 112 \rightarrow (x - 16)(x + 7) = 0 \rightarrow x = 16$ or $x = -7$

Power Pack · Quadratic equations — Answer key

Rearrange, then solve

5. $x^2 - 16x = -28 \rightarrow (x - 2)(x - 14) = 0 \rightarrow x = 2$ or $x = 14$

9. $x^2 - 20x = -91 \rightarrow (x - 13)(x - 7) = 0 \rightarrow x = 13$ or $x = 7$

6. $x^2 + 2x = 323 \rightarrow (x - 17)(x + 19) = 0 \rightarrow x = 17$ or $x = -19$

10. $x^2 + 21x = -68 \rightarrow (x + 17)(x + 4) = 0 \rightarrow x = -17$ or $x = -4$

7. $x^2 + 3x = 54 \rightarrow (x + 9)(x - 6) = 0 \rightarrow x = -9$ or $x = 6$

8. $x^2 + 12x = -32 \rightarrow (x + 4)(x + 8) = 0 \rightarrow x = -4$ or $x = -8$

Real solutions

1. $x^2 + 13x + 155 = 0$: $13^2 - 4 \times 1 \times 155 = 169 - 620 = -451 \rightarrow$ None

5. $x^2 - 2x + 28 = 0$: $-2^2 - 4 \times 1 \times 28 = 4 - 112 = -108 \rightarrow$ None

9. $x^2 - 20x + 100 = 0$: $-20^2 - 4 \times 1 \times 100 = 400 - 400 = 0 \rightarrow$ One

2. $x^2 - 15x + 87 = 0$: $-15^2 - 4 \times 1 \times 87 = 225 - 348 = -123 \rightarrow$ None

6. $x^2 - 33x + 6 = 0$: $-33^2 - 4 \times 1 \times 6 = 1089 - 24 = 1065 \rightarrow$ Two

10. $x^2 + 10x + 25 = 0$: $10^2 - 4 \times 1 \times 25 = 100 - 100 = 0 \rightarrow$ One

3. $x^2 - 3x - 144 = 0$: $-3^2 - 4 \times 1 \times -144 = 9 - -576 = 585 \rightarrow$ Two

7. $x^2 + 3x + 128 = 0$: $3^2 - 4 \times 1 \times 128 = 9 - 512 = -503 \rightarrow$ None

4. $x^2 - 27x - 119 = 0$: $-27^2 - 4 \times 1 \times -119 = 729 - -476 = 1205 \rightarrow$ Two

8. $x^2 - 14x + 49 = 0$: $-14^2 - 4 \times 1 \times 49 = 196 - 196 = 0 \rightarrow$ One

