

Algebra 1 · Solving Quadratic Equations · Worksheet

Common Core A-REI.B.4a, A-REI.B.4b, A-APR.B.3, A-CED.A.1 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

These problems practice solving quadratic equations, following Common Core A-REI.B.4. They start with square roots and the zero-product property, then move to completing the square, the quadratic formula and the discriminant.

The last problems turn real situations into quadratic equations: a poster, a stone, consecutive integers, a garden border and ticket sales. Show every step and check each answer.

Algebra 1 Common Core: A-REI.B.4a · A-REI.B.4b · A-APR.B.3 · A-CED.A.1

Problem 1: Standard form

Write each equation in the form $ax^2+bx+c=0$ and name a , b and c .

a. $3x^2=5x-2$

b. $x(x+4)=21$

Problem 2: Perfect-square roots

Solve each equation.

a. $x^2=81$

b. $x^2-11=25$

Problem 3: Square roots, not perfect

Solve each equation. Give exact answers, and round part (a) to the nearest hundredth.

a. $x^2=20$

b. $3x^2=75$

Problem 4: Square both sides back

Solve $(x-3)^2=16$. Locate the solutions on the number line.



A number line for the equation.

Problem 5: Square roots with a shift

Solve $(x+2)^2=10$. Give exact answers and decimals rounded to the nearest hundredth.

Problem 6: Zero-product property

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

Problem 7: Factor a trinomial

Solve $x^2+9x+20=0$ by factoring.

Problem 8: Negative constant

Solve $x^2-3x-28=0$ by factoring.

Problem 9: Common factor

Solve each equation.

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

b. $x^2+8x=0$

Problem 10: Rearrange first

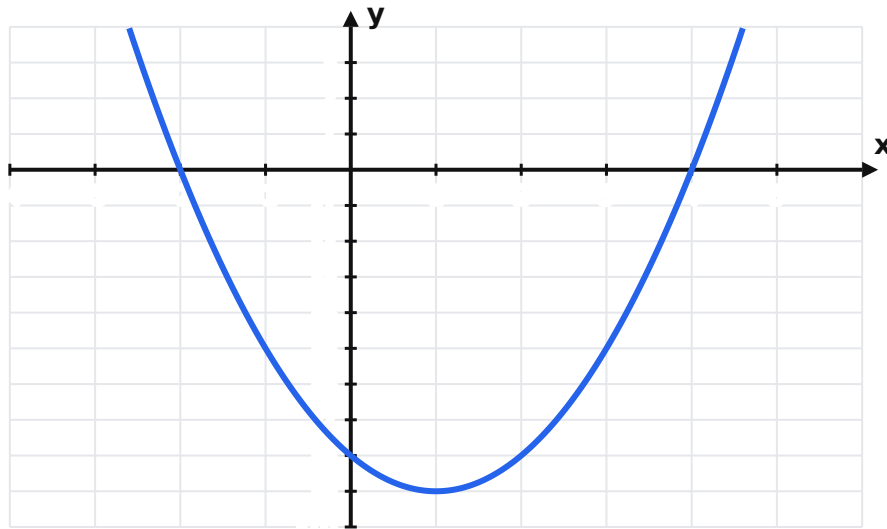
Solve $x^2=2x+15$.

Problem 11: Leading coefficient 2

Solve $2x^2+7x+3=0$ by factoring.

Problem 12: Solve from a graph

The graph of $y=x^2-2x-8$ is shown. Use it to solve $x^2-2x-8=0$. Then confirm the answers by factoring.



The graph of $y = x^2 - 2x - 8$.

Problem 13: Complete the square

Solve $x^2 + 6x + 5 = 0$ by completing the square.

Problem 14: Irrational solutions

Solve $x^2 - 8x + 3 = 0$ by completing the square. Give exact and rounded answers.

Problem 15: Odd middle coefficient

Solve $x^2 + 5x - 2 = 0$ by completing the square.

Problem 16: Divide first

Solve $2x^2 - 12x + 10 = 0$ by completing the square.

Problem 17: Use the formula

Solve $2x^2 - 5x - 3 = 0$ with the quadratic formula.

Problem 18: Formula with a radical

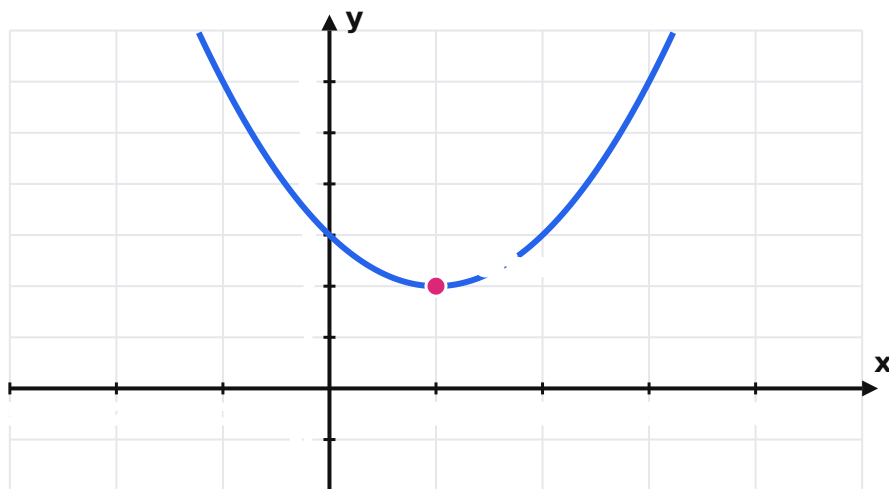
Solve $x^2 - 4x - 3 = 0$ with the quadratic formula. Give the exact answer in simplest form and decimals rounded to the nearest hundredth.

Problem 19: Formula, a not 1

Solve $3x^2 - 4x - 2 = 0$. Round to the nearest hundredth.

Problem 20: Discriminant and graph

The graph of $y = x^2 - 2x + 3$ is shown. How many real solutions does $x^2 - 2x + 3 = 0$ have? Confirm with the discriminant.



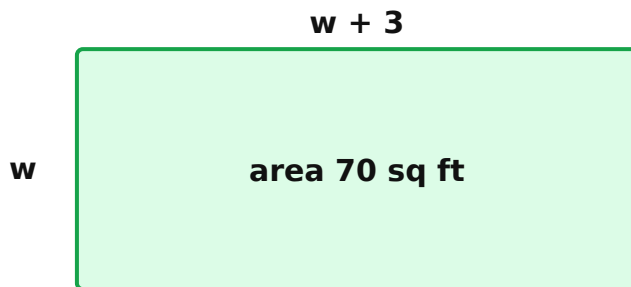
The graph of $y = x^2 - 2x + 3$.

Problem 21: Find k

For what value of k does $x^2 + 6x + k = 0$ have exactly one real solution? Find that solution.

Problem 22: Rectangle area

The length of a rectangular poster is 3 feet more than its width. Its area is 70 square feet. Find the dimensions.



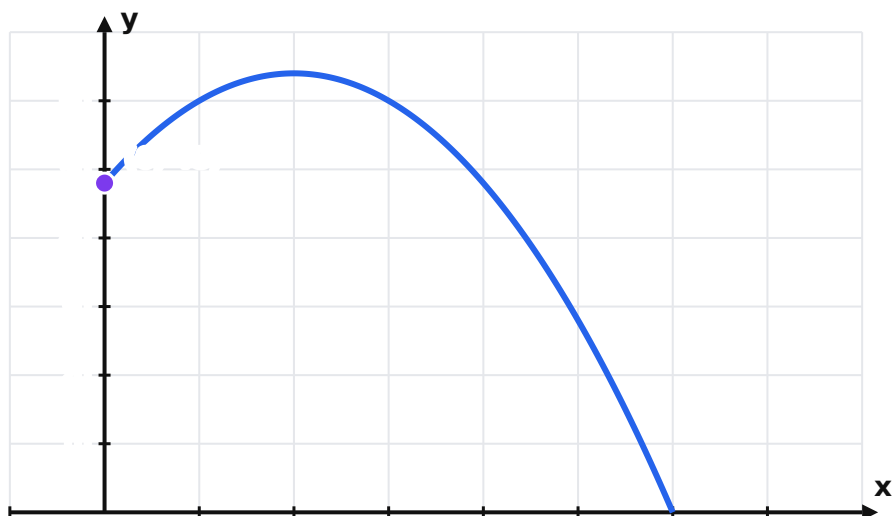
Rectangle model for the problem.

Problem 23: Stone from a cliff

Priya tosses a stone upward from a ledge. Its height in feet after t seconds is $h(t) = -16t^2 + 32t + 48$.

- a. When does the stone hit the ground?

b. At what times is the height 48 feet?



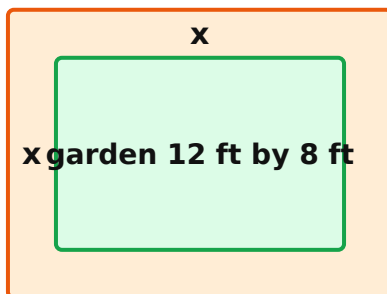
Height of a stone (feet) against time (seconds).

Problem 24: Consecutive integers

The product of two consecutive positive integers is 156. Find the integers. Is there another pair of consecutive integers with product 156?

Problem 25: Garden border

Aisha has a garden that is 12 feet by 8 feet. She builds a stone border of uniform width x around it. The garden and border together have an area of 192 square feet. Find x .



Garden with a uniform border.

Problem 26: School play tickets

The drama club sells $200 - 10x$ tickets when the price is x dollars. The revenue is $x(200 - 10x)$.

- At what price is the revenue \$1,000?
- Can the revenue reach \$1,200? Use the discriminant to decide.

Problem 27: Find the error

Liam solves $x^2 - 5x = 14$ like this: $x(x-5) = 14$, so $x = 14$ or $x - 5 = 14$. Explain his mistake and solve the equation correctly.