

Quadratic Method Match

Choose a method, solve exactly, and interpret each result.

HIGH SCHOOL • HSA-REI.B.4b

CCSS.Math.Content.HSA-REI.B.4b "Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation..."

NAME _____

DATE _____

PICK THE RIGHT TOOL

First write the equation in the form $ax^2 + bx + c = 0$, then choose a method that fits: factor, take square roots, complete the square, or use $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. If $b^2 - 4ac$ is negative, the solutions are complex and include i .

WORKED EXAMPLE

Solve $x^2 - 10x + 21 = 0$.

- Factor: $(x - 3)(x - 7) = 0$.
- Set each factor equal to 0: $x - 3 = 0$ or $x - 7 = 0$.
- Solve: $x = 3$ or $x = 7$.

Answer: $x = 3$ or $x = 7$

PRACTICE 6 problems

1 Solve by inspection: $x^2 = 36$.

ANSWER _____

2 Solve by factoring: $x^2 + 13x + 40 = 0$.

ANSWER _____

3 Solve by taking square roots: $x^2 - 16 = 0$.

ANSWER _____

4 Solve by completing the square: $x^2 + 4x - 12 = 0$.

ANSWER _____

5 Solve using the quadratic formula: $x^2 + 2x + 5 = 0$.

ANSWER _____

6 Solve using the quadratic formula: $x^2 - 2x - 1 = 0$.

ANSWER _____

APPLY IT Show your work

- 1** For a trick-shot video, a ball's height h in meters is modeled by $h = -4t^2 + 16t + 20$, where t is time in seconds. When does the ball hit the ground?

WORK SPACE

ANSWER _____

- 2** A student designs a rectangular poster for a club event. Its length is $x + 4$ inches, its width is $x - 2$ inches, and its area is 27 square inches. Find x and the poster's dimensions.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Solve $4x^2 + 4x + 5 = 0$. Then explain why the equation has no real solutions.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Solve by inspection: $x^2 = 36$.	$x = 6$ or $x = -6$
2	Solve by factoring: $x^2 + 13x + 40 = 0$.	$x = -5$ or $x = -8$
3	Solve by taking square roots: $x^2 - 16 = 0$.	$x = 4$ or $x = -4$
4	Solve by completing the square: $x^2 + 4x - 12 = 0$.	$x = 2$ or $x = -6$
5	Solve using the quadratic formula: $x^2 + 2x + 5 = 0$.	$x = -1 \pm 2i$
6	Solve using the quadratic formula: $x^2 - 2x - 1 = 0$.	$x = 1 \pm \sqrt{2}$

PART 2 • APPLY IT

- t = 5 seconds** Set h equal to 0 and solve $-4t^2 + 16t + 20 = 0$. The solutions are $t = 5$ and $t = -1$, but only 5 seconds is a possible time.
- x = 5; dimensions: 9 inches by 3 inches** Write $(x + 4)(x - 2) = 27$, then solve $x^2 + 2x - 35 = 0$. The solutions are $x = 5$ and $x = -7$, but $x = 5$ gives positive dimensions.

CHALLENGE

$x = -1/2 \pm i$; there are no real solutions because $b^2 - 4ac = -64$, which is negative.

Accept roots in either order and equivalent exact forms. For the word problems, accept only the nonnegative time and the value that produces positive dimensions.