LESSON MAKER PRO

Quadratic Equation Quest

Use factoring, square roots, and the quadratic formula to solve.

HIGH SCHOOL · HSA-REI.B.4

CCSS.Math.Content.HSA-REI.B.4 "Solve quadratic equations in one variable."

NAME _____ DATE _____

CHOOSE A METHOD

First, write the equation so one side equals 0. If the quadratic factors, set each factor equal to 0. If it does not factor easily, isolate a squared expression or use $x = (-b \pm \sqrt{b^2 - 4ac})/(2a)$.

WORKED EXAMPLE

Solve $x^2 - 11x + 24 = 0$.

1. Factor the trinomial: $(x - 3)(x - 8) = 0$.
2. Set each factor equal to 0: $x - 3 = 0$ or $x - 8 = 0$.
3. Solve each equation: $x = 3$ or $x = 8$.

Answer: x = 3 or x = 8

PRACTICE 6 problems

1 Solve $x^2 - 9x + 14 = 0$.

ANSWER _____

2 Solve $2x^2 + 9x - 5 = 0$.

ANSWER _____

3 Solve $4x^2 - 25 = 0$.

ANSWER _____

4 Solve $(x + 4)^2 = 36$.

ANSWER _____

5 Solve $x^2 + 2x - 7 = 0$.

ANSWER _____

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

ANSWER _____

APPLY IT Show your work

1 A basketball's height, in feet, t seconds after a shot is $h = -4t^2 + 12t + 16$. When does the ball hit the floor?

WORK SPACE

ANSWER _____

2 A student club is making a rectangular photo backdrop with an area of 96 square feet. Its width is x feet, and its length is x + 4 feet. Find the width and length.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve $2x^2 + 4x + 7 = 0$ over the complex numbers. Show why the solutions are not real.

WORK SPACE AND ANSWER

ANSWER KEY # Quadratic Equation Quest

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 - 9x + 14 = 0$.	**x = 2 or x = 7**
2	Solve $2x^2 + 9x - 5 = 0$.	**x = 1/2 or x = -5**
3	Solve $4x^2 - 25 = 0$.	**x = 5/2 or x = -5/2**
4	Solve $(x + 4)^2 = 36$.	**x = 2 or x = -10**
5	Solve $x^2 + 2x - 7 = 0$.	**x = -1 + 2sqrt(2) or x = -1 - 2sqrt(2)**
6	Solve $6x^2 - x - 2 = 0$.	**x = 2/3 or x = -1/2**

PART 2 · APPLY IT

1. **4 seconds** Set h equal to 0 and solve $-4t^2 + 12t + 16 = 0$. The solutions are t = 4 and t = -1, so only 4 seconds makes sense.
2. **width = 8 feet, length = 12 feet** Write $x(x + 4) = 96$, then solve $x^2 + 4x - 96 = 0$. The positive solution is x = 8, so the length is 12.

CHALLENGE

x = -1 + i sqrt(10)/2 or x = -1 - i sqrt(10)/2. The discriminant is -40, which is negative, so there are no real solutions.

Accept solutions in either order and equivalent exact forms, including radical forms such as (-2 ± sqrt(32))/2. For the word problems, accept only the nonnegative time and positive dimensions.