LESSON MAKER PRO

Quadratic Equation Quest

Write and solve equations from algebra, shapes, and graphs.

HIGH SCHOOL · MA.912.AR.3.2

MA.912.AR.3.2 "Given a mathematical or real-world context, write and solve one-variable quadratic equations over the real and complex number systems."

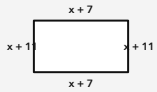
NAME _____ DATE _____

ZERO FIRST

Write the quadratic equation, then set it equal to 0. Factor when possible. If the discriminant is negative, the solutions use i, where $i^2 = -1$.

WORKED EXAMPLE

The rectangle has an area of 192 square units. Write and solve an equation for x.



1. $(x + 7)(x + 11) = 192$
2. $x^2 + 18x - 115 = 0$
3. $(x + 23)(x - 5) = 0$
4. $x = -23$ or $x = 5$. Use $x = 5$.

Answer: x = 5; the rectangle is 12 units by 16 units.

PRACTICE 4 problems

1 Solve $x^2 - 17x + 72 = 0$.

ANSWER _____

2 Solve $x^2 + 20x + 109 = 0$.

ANSWER _____

3 Solve $2x^2 - 128 = 0$.

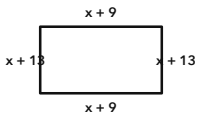
ANSWER _____

4 Solve $x^2 - 28x + 195 = 0$.

ANSWER _____

APPLY IT Show your work

1 The stage floor in the figure has an area of 672 square feet. Find x and the floor dimensions.



ANSWER _____

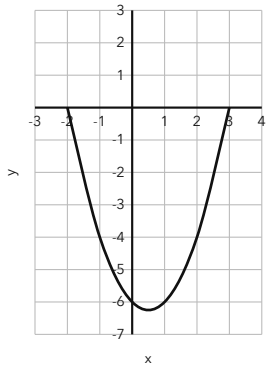
2 A game models a ball's height, in feet, by $h = -2x^2 + 14x + 60$, where x is time in seconds. When does the ball hit the ground?

WORK SPACE

ANSWER _____

CHALLENGE One step up

The graph shows a quadratic with leading coefficient 1. Write its factored equation, then give both solutions when y = 0.



WORK SPACE AND ANSWER

ANSWER KEY

Quadratic Equation Quest

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 - 17x + 72 = 0$.	**x = 8 or x = 9**
2	Solve $x^2 + 20x + 109 = 0$.	**x = -10 + 3i or x = -10 - 3i**
3	Solve $2x^2 - 128 = 0$.	**x = 8 or x = -8**
4	Solve $x^2 - 28x + 195 = 0$.	**x = 13 or x = 15**

PART 2 · APPLY IT

1. **x = 15; 24 ft by 28 ft** Write $(x + 9)(x + 13) = 672$. This gives $x^2 + 22x - 555 = 0$, so x = 15 or -37; use 15.
2. **10 seconds** Set h = 0: $-2x^2 + 14x + 60 = 0$. The solutions are x = 10 and x = -3, so the physical time is 10 seconds.

CHALLENGE

y = (x + 2)(x - 3); x = -2 or x = 3

Accept roots in either order and equivalent factored or expanded equations. For context problems, accept only the positive value of x or time.