LESSON MAKER PRO

Quadratic Choices

Choose a method that fits the equation.

HIGH SCHOOL · A1P.AF.C.9.b

A1P.AF.C.9.b "Solve quadratic equations by inspection (such as $x^2 = 49$), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation..."

NAME _____ DATE _____

CHOOSE YOUR METHOD

If a square is isolated, take square roots. If not, look for factors, complete the square, or use the quadratic formula. Include both roots when taking the square root of a positive number. A square cannot equal a negative number if x is real.

WORKED EXAMPLE

Solve $x^2 = 169$.

1. Take square roots of both sides: $x = \pm\sqrt{169}$.
2. Simplify: $x = \pm 13$.

Answer: x = -13 or x = 13

PRACTICE 6 problems

1 Solve $x^2 = 36$.

ANSWER _____

2 Solve $(x - 4)^2 = 25$.

ANSWER _____

3 Solve by factoring: $x^2 - 7x + 12 = 0$.

ANSWER _____

4 Solve using the quadratic formula: $2x^2 + 4x - 1 = 0$.

ANSWER _____

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

ANSWER _____

6 Solve over the real numbers: $x^2 + 2x + 7 = 0$.

ANSWER _____

APPLY IT Show your work

1 A school esports club sells x tickets for (20 - x) dollars each. It earns $96. How many tickets could the club have sold?

WORK SPACE

ANSWER _____

2 A foam ball is tossed upward from a balcony. Its height in feet after x seconds is $-16x^2 + 32x + 48$. When does it hit the ground?

WORK SPACE

ANSWER _____

CHALLENGE One step up

A student says $x^2 + 4x + 8 = 0$ has no real solutions, but $x^2 + 4x + 4 = 0$ has exactly one real solution. Is the student right? Complete the square to explain.

WORK SPACE AND ANSWER

ANSWER KEY # Quadratic Choices

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 = 36$.	**$x = -6$ or $x = 6$**
2	Solve $(x - 4)^2 = 25$.	**$x = -1$ or $x = 9$**
3	Solve by factoring: $x^2 - 7x + 12 = 0$.	**$x = 3$ or $x = 4$**
4	Solve using the quadratic formula: $2x^2 + 4x - 1 = 0$.	**$x = (-2 + \sqrt{6})/2$ or $x = (-2 - \sqrt{6})/2$**
5	Solve by completing the square: $x^2 + 6x + 2 = 0$.	**$x = -3 + \sqrt{7}$ or $x = -3 - \sqrt{7}$**
6	Solve over the real numbers: $x^2 + 2x + 7 = 0$.	**No real solutions**

PART 2 · APPLY IT

1. **8 tickets or 12 tickets** Set $x(20 - x) = 96$ and rearrange to $x^2 - 20x + 96 = 0$. Factoring gives $(x - 8)(x - 12) = 0$, so both ticket counts work.
2. **After 3 seconds** Set the height to 0 and factor: $-16(x - 3)(x + 1) = 0$. The solution $x = -1$ is before the ball was tossed, so the ball hits the ground at $x = 3$.

CHALLENGE

Yes. The first equation becomes $(x + 2)^2 = -4$, which has no real solutions. The second becomes $(x + 2)^2 = 0$, which has exactly one solution, $x = -2$.

Accept equivalent exact radical forms. For the challenge, accept any explanation that correctly identifies why a square cannot equal -4 and why a square equals 0 only when its base is 0.