LESSON MAKER PRO

Choose Your Method

Solve quadratics by using their structure.

HIGH SCHOOL · A-REI.4b

A-REI.4b "Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation..."

NAME _____ DATE _____

MATCH THE METHOD

Look at the equation before you choose a method. Isolate a squared expression to take square roots, factor when you can, or complete the square. The quadratic formula works for any quadratic. If it gives a negative number under the square root, the solutions are complex, where $i = \sqrt{(-1)}$.

WORKED EXAMPLE

Solve $x^2 + 18x + 26 = 0$.

1. Subtract 26: $x^2 + 18x = -26$.
2. Add 81 to both sides: $(x + 9)^2 = 55$.
3. Take both square roots: $x + 9 = \pm\sqrt{55}$.

Answer: $x = -9 \pm \sqrt{55}$

PRACTICE 6 problems

1 Solve $x^2 = 64$.

ANSWER _____

2 Solve $(x - 6)^2 = 16$.

ANSWER _____

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

ANSWER _____

4 Solve $2x^2 + 5x - 3 = 0$.

ANSWER _____

5 Solve $x^2 + 4x + 7 = 0$. If the solutions are complex, write them using i.

ANSWER _____

6 Solve $x^2 + 8x + 5 = 0$.

ANSWER _____

APPLY IT Show your work

1 A ball launched from a skate ramp has a height of $-x^2 + 6x + 7$ meters after x seconds. At what times is the ball 15 meters high?

WORK SPACE

ANSWER _____

2 For a school event, a student estimates that charging x dollars per ticket will sell 20 - x tickets. What ticket prices would bring in $96?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Solve $x^2 - 6x + 13 = 0$. Explain how you know the solutions are not real.

WORK SPACE AND ANSWER

ANSWER KEY

Choose Your Method

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Solve $x^2 = 64$.	**x = -8 or x = 8**
2	Solve $(x - 6)^2 = 16$.	**x = 2 or x = 10**
3	Solve $x^2 - 7x + 12 = 0$.	**x = 3 or x = 4**
4	Solve $2x^2 + 5x - 3 = 0$.	**x = -3 or x = 1/2**
5	Solve $x^2 + 4x + 7 = 0$. If the solutions are complex, write them using i.	**x = -2 ± i√3**
6	Solve $x^2 + 8x + 5 = 0$.	**x = -4 ± √11**

PART 2 · APPLY IT

1. **After 2 seconds and after 4 seconds.** Set $-x^2 + 6x + 7 = 15$, then rewrite as $x^2 - 6x + 8 = 0$. Factoring gives $(x - 2)(x - 4) = 0$.
2. **$8 or $12 per ticket.** Set $x(20 - x) = 96$, then rewrite as $x^2 - 20x + 96 = 0$. Factoring gives $(x - 8)(x - 12) = 0$.

CHALLENGE

x = 3 ± 2i. The discriminant is $(-6)^2 - 4(1)(13) = -16$, which is negative, so neither solution is real.

Accept the two solutions in either order or written with ±. For the challenge, accept completing the square as an explanation if it shows $(x - 3)^2 = -4$.