

**LESSON**  
**3-1**

# Solving Quadratic Equations by Taking Square Roots

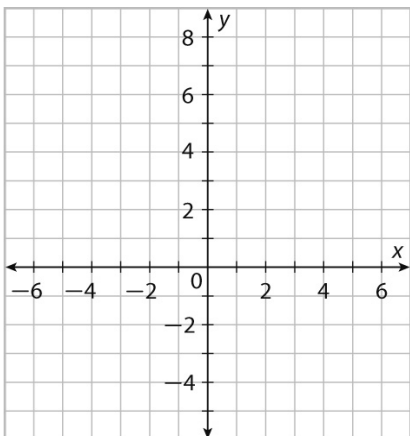
## Practice and Problem Solving: A/B

For Problems 1–3, solve the equation  $-2x^2 + 7 = -1$  using the indicated method. Show your work.

1. Solve by graphing.

2. Solve by factoring.

3. Solve by taking square roots.



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Find the square of each imaginary number.

4.  $4i$

5.  $i\sqrt{11}$

6.  $\frac{i\sqrt{7}}{3}$

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Determine whether each equation has real or imaginary solutions by solving.

7.  $7x^2 - 12 = 0$

8.  $x^2 + 9 = 3$

9.  $2(x^2 - 1) = (x^2 - 3)$

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Recall the equation for falling objects:  $h(t) = h_0 - 16t^2$ , where  $h$  is the height of the object, in feet, at any time  $t$ , in seconds, and  $h_0$  is the object's initial height in feet. Use this equation for Problems 10–11.

10. A carpenter dropped a hammer from a rooftop 48 feet above ground. How long did it take the hammer to hit the ground?

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11. An acorn fell from a branch 20 feet high and landed on a branch 7 feet high. How long did it take the acorn to fall?

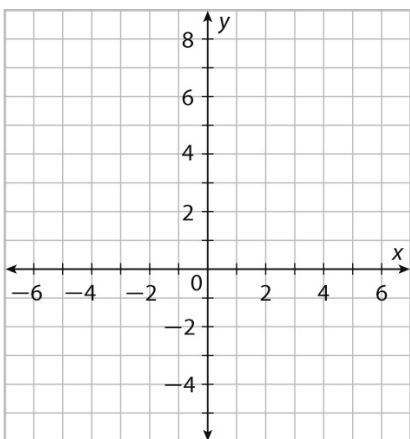
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# Solving Quadratic Equations by Taking Square Roots

## Practice and Problem Solving: C

For Problems 1–3, solve the equation  $\frac{1}{2}x^2 - 3 = 5$  using the indicated method. Show your work.

12. Solve by graphing.



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13. Solve by factoring.

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14. Solve by taking square roots.

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Find the square of each imaginary number.

15.  $-21i$

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16.  $2i\sqrt{97}$

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17.  $-\frac{3i\sqrt{21}}{5}$

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Determine whether each equation has real or imaginary solutions by solving.

18.  $\frac{1}{3}x^2 + 15 = -21$

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19.  $-15x^2 + 44 = 2$

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20.  $6(3x^2 - 1) = 3(5x^2 - 7)$

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Solve.

21. The length of a rectangular garden is 4 times its width. The area is 102 square feet. What are the dimensions of the garden?

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22. A rock fell from a cliff 108 feet high and landed on an embankment 25 feet from the ground. Use the equation  $h = \frac{1}{2} \times 16 \times t^2$  to find how long it took the rock to fall to the embankment?

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