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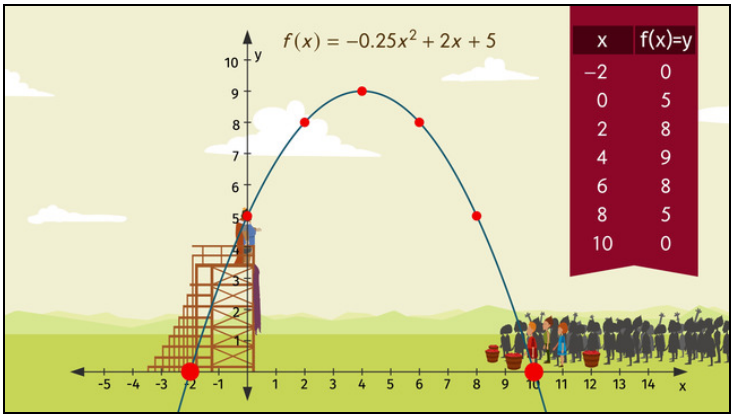
Word Problems with Quadratic Equations



1. **Name the methods for solving quadratic equations.**
2. Explain how to solve a quadratic equation by factoring.
3. Determine how to solve quadratic equations graphically.
4. Determine how to solve quadratic equations by completing the square.
5. Calculate where the castle ditches have to be built by using the quadratic formula.
6. Solve the following quadratic equations.

\+ with lots of tips, answer keys, and detailed answer explanations for all of the problems.

The complete package, **including all problems, hints, answers, and detailed answer explanations** is available for all sofatutor.com subscribers.

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Name the methods for solving quadratic equations.

Choose the correct methods.

$$ax^2 + bx + c = 0$$

$$x^2 + bx + c = 0$$

- [ ] **A** We always have to use the quadratic formula to get the correct solutions.
- [ ] **B** We can draw the parabola corresponding to the quadratic equation. The x-intercepts are the desired solutions.
- [ ] **C** We can factor the left-hand side of the quadratic equation $x^2 + bx + c = 0$ and then solve the two resulting linear equations.
- [ ] **D** The desired solution is always $x = c$
- [ ] **E** We can complete the quadratic polynomial on the left-hand side to a square and solve the equation by taking the square root.

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Hints for solving these problems

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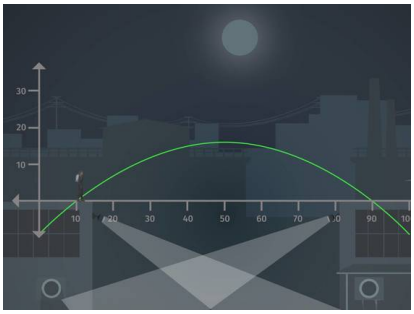
Name the methods for solving quadratic equations.

Hint #1



The solutions of the corresponding quadratic equation are $x = 10$ and $x = 90$.

Hint #2

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

This is the quadratic formula.

Hint #3

The zero factor property states that if a product is equal to zero then one of its factors must also equal zero.

Hint #4

It doesn't matter at all which method you choose to find the solutions. If the solutions exist, then they are always the same.

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Answers and detailed answer explanations for these problems

1 of 6

Name the methods for solving quadratic equations.

Answer key: B, C, E

If you have to solve a quadratic equation like $ax^2+bx+c=0$, or with $a=1$, $x^2+bx+c=0$, which you can derive by dividing the equation $ax^2+bx+c=0$ by a, then you can decide from several methods:

1. You could factor the left-hand side of the equation $x^2+bx+c=0$ to $(x+d)(x+e)=0$ and get the solutions $x=-d$ and $x=-e$.

2. You can complete the square to get $(x+e)^2=d$. You can solve this equation by taking the square root of both sides.

3. You can use the quadratic formula for solving $ax^2+bx+c=0$.

4. You also could draw the parabola corresponding to $f(x)=ax^2+bx+c$. The x-intercepts of this parabola are the desired solutions.

It doesn't matter which method you choose, as the solutions, if they exist, are always the same.

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