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Finding the Value that Completes the Square

$$-45 \left(-\frac{1}{45}x^2 + \frac{16}{9}x - \frac{140}{9} \right) = 0$$
$$x^2 - 80x + c = -700$$
$$ax^2 + bx + c = 0$$

- 1 Identify the polynomial which is equal to $(a + b)^2$.
- 2 Explain how to solve the given function.
- 3 Solve the given quadratic equation.
- 4 Find the missing value c that completes the square.
- 5 Decide which equation(s) will give General Good's jetpack the right distance to jump.
- 6 Find the two solutions of the following equation.
- + 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](https://www.sofatutor.com) subscribers.



Identify the polynomial which is equal to $(a + b)^2$.

Choose the correct term.

$$(a + b)^2 = ?$$

$a^2 + ab + b^2$ **A**

$2a^2 + 2ab + 2b^2$ **B**

$a^2 + 2ab + b^2$ **C**

$a^2 + 2a + b^2$ **D**

$a^2 + 2b + b^2$ **E**

$a^2 + 2ab - b^2$ **F**



Hints for solving these problems

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of 6

Identify the polynomial which is equal to $(a + b)^2$.

Hint #1

Factor out the squared binomial $(a + b)^2 = (a + b)(a + b)$ using the FOIL method.

Hint #2

For example, $x^2 + 6x + 9 = (x + 3)^2$.



Answers and detailed answer explanations for these problems

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of 6

Identify the polynomial which is equal to $(a + b)^2$.

Answer key: C

Finding the value that completes the square leads to the following:

$$(a + b)^2 = a^2 + 2ab + b^2.$$

So if you already have a binomial like $x^2 + 6x$ you have to find a value that completes this binomial to a perfect trinomial which can be factored.

This value for $x^2 + 6x$ is $\left(\frac{6}{2}\right)^2 = 3^2 = 9$, giving us that

$$x^2 + 6x + 9 - 9 = (x + 3)^2 - 9.$$

The trinomial on the left $x^2 + 6x + 9$ is the desired perfect trinomial.