

A quadratic equation is shown: $x^2 - 14x + 41 = 0$

Which of the following is the first correct step to write the above equation in the form $(x - p)^2 = q$, where p and q are integers?

$$x^2 - 14x + 41 + 8 = 0 + 8$$

$$x^2 - 14x + 41 + 9 = 0 + 9$$

$$x^2 - 14x + 41 - 8 = 0 - 8$$

$$x^2 - 14x + 41 - 9 = 0 - 9$$

Answer 1

Answer:

Answer:

The correct answer is the first option

Step-by-step explanation:

Quadratic Equation

The standard form of a quadratic equation is

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

Sometimes we need to change the expression of the same equation to the form

$$(x - p)^2 = q$$

To accomplish that change, we usually modify the left-hand expression to make it look like the square of a binomial.

The given quadratic equation is

$$x^2 - 14x + 41 = 0$$

Recall the square of a binomial is

$$(x+p)^2 = x^2 + 2px + p^2$$

The first term is already present. The second term gives us the value of p:

$$2p = -14$$

Solving

$$p = -7$$

Now we need to produce the third term $p^2 = 49$. We only have 41, thus we need to add 8 to both sides of the equation:

$$x^2 - 14x + 41 + 8 = 0 + 8$$

The correct answer is the first option

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