Name _____   Date _____

Quadratic Equations: Completing the Square - Guided Lesson Explanation

For the problems we can complete the square by adding $(\frac{b}{2})^2$ with quadratic expressions like $x^2 + bx$.

Explanation#1

Now we will add $(\frac{b}{2})^2$ to complete the square.

$$t^2 + 16t + (\frac{b}{2})^2$$

$$= t^2 + 16t + (\frac{16}{2})^2$$

$$= t^2 + 16t + (8)^2$$

$$= t^2 + 16t + 64$$

So, this quadratic can be written as a square, $(t + 8)^2$, and therefore it is a perfect-square quadratic.

So, the number needed to complete the square was 64.

Explanation#2

Now we will add $(\frac{b}{2})^2$ to complete the square.

$$t^2 + 26t + (\frac{b}{2})^2$$

$$= t^2 + 26t + (\frac{26}{2})^2$$

$$= t^2 + 26t + (13)^2$$

$$= t^2 + 26t + 169$$

So, this quadratic can be written as a square, $(t + 13)^2$, and therefore it is a perfect-square quadratic.

So, the number needed to complete the square was 169.

Explanation#3

Now we will add $(\frac{b}{2})^2$ to complete the square.

$$t^2 + 18t + (\frac{b}{2})^2$$

$$= t^2 + 18t + (\frac{18}{2})^2$$

$$= t^2 + 18t + (9)^2$$

$$= t^2 + 18t + 81$$

So, this quadratic can be written as a square, $(t + 9)^2$, and therefore it is a perfect-square quadratic.

So, the number needed to complete the square was 81.