

## Algebra /

### Solving a quadratic equation by completing the square: Exact answers

$$x^2 - 10x + 23 = 0$$

~~+23~~  
~~-23~~  
 Nothing

Quadratic Formula  

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

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

$$x^2 - 10x + 25 = -23 + 25$$

$$(x-5)(x-5) = 2$$

$$\sqrt{(x-5)^2} = \sqrt{2}$$

$$x-5 = \pm\sqrt{2}$$

$$x = 5 \pm \sqrt{2}$$

$$x = 5 + \sqrt{2}, 5 - \sqrt{2}$$

$$\left(x + \frac{b}{2}\right)^2 \quad \left(\frac{b}{2}\right)^2$$

$$b = -10$$

$$\left(\frac{-10}{2}\right)^2 = (-5)^2 = 25$$

Sketches:  
 How do you solve:  
 $\sqrt{x^2} = \sqrt{25}$  when you do  
 $x = \pm 5$  inside  
 the equation  
 put  $\pm$   
 $5^2 = 25$   
 $(-5)^2 = 25$

$$x^2 + 12x + 22 = 0$$

~~-22~~ ~~-22~~

$$x^2 + 12x + 36 = -22 + 36$$

$$\sqrt{(x+6)^2} = \sqrt{14}$$

$$x+6 = \pm\sqrt{14}$$

$$x = -6 \pm \sqrt{14}$$

$$x = -6 + \sqrt{14}, -6 - \sqrt{14}$$

$$\left(\frac{b}{2}\right)^2 \quad \left(\frac{12}{2}\right)^2 = 6^2 = 36$$

$$\left(x + \frac{b}{2}\right)^2$$

$$x^2 + 10x + 12 = 0$$

~~+12~~ ~~-12~~

$$x^2 + 10x + 25 = -12 + 25$$

$$(x+5)(x+5)$$

$$\sqrt{(x+5)^2} = \sqrt{13}$$

$$x+5 = \pm\sqrt{13}$$

$$x = -5 \pm \sqrt{13}$$

$$x = -5 + \sqrt{13}, -5 - \sqrt{13}$$

$$\left(x + \frac{b}{2}\right)^2$$

Don't Factor

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