

# Quick Check

$$\textcircled{1} \sqrt{24}$$

4·6

$$\textcircled{2\sqrt{6}}$$

$$\textcircled{2} \sqrt{32}$$

16·2

$$\textcircled{4\sqrt{2}}$$

$$\textcircled{3} \sqrt{98}$$

49·2

$$\textcircled{7\sqrt{2}}$$

$$\textcircled{4} 5\sqrt{20}$$

4·5

$$5 \cdot 2\sqrt{5}$$

$$\textcircled{10\sqrt{5}}$$

Perfect Squares 1, 4, 9, 16, 25, 36, 49

64, 81, 100, 121, 144, ...

## 4.7b How to Complete the Square

\* Making perfect square tri's

Look at

$$x^2 + 10x + 25$$

5 · 5  
(x+5)(x+5)  
(x+5)<sup>2</sup>

$$x^2 - 8x + 16$$

-4 · -4  
(x-4)(x-4)  
(x-4)<sup>2</sup>

$$x^2 + 12x + \underline{?36}$$

cut in half  
6 · 6

\* Look at middle (x) term.

Cut in half ( $\div 2$ ).

Then multiply by itself (square it)

$$x^2 - 22x + \underline{?121}$$

$\frac{22}{2} = 11$   
 $11 \cdot 11 = 121$

Solve by CTS

①  $x^2 - 12x + 4 = 0$

1<sup>st</sup> - Can't factor,  
So clear out the  
# to other side

$$x^2 - 12x + 36 = -4 + 36$$

$\frac{12}{2} = 6$  6 · 6 = 36

2<sup>nd</sup> - Complete the  $\square$   
? add to both sides

$$x^2 - 12x + 36 = 32$$

(x-6)(x-6)

3<sup>rd</sup> - Write in Compact  
form

$$\sqrt{(x-6)^2} = \sqrt{\frac{32}{16 \cdot 2}}$$

4<sup>th</sup> - Solve like before

$$x-6 = \pm 4\sqrt{2}$$

+6    +6

$$x = 6 \pm 4\sqrt{2}$$

How about

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

-14   -14

$$\frac{2x^2 + 8x}{2} = -14$$

$$x^2 + 4x + 4 = -7 + 4$$

$$x + 2 = \pm \sqrt{3} \sqrt{-1}$$

-2   -2

$$x^2 + 4x + 4 = -3$$

$$x = -2 \pm i\sqrt{3}$$

$$\sqrt{(x+2)^2} = \sqrt{3}$$

↓  
i

$$\textcircled{11} \quad 9x^2 - 12x + 4 = -3$$

$$(3x - 2)(3x - 2)$$

$$\sqrt{(3x-2)^2} = \sqrt{*3}$$

$$3x-2 = \pm i\sqrt{3}$$

$$+2 \quad +2$$

$$\frac{3x}{3} = \frac{2 \pm i\sqrt{3}}{3}$$

$$x = \frac{2 \pm i\sqrt{3}}{3}$$