

**Practice** - Factor each of the following perfect square trinomial:

$$\begin{array}{l} 6 \times 6 = 36 \\ 6 + 6 = 12 \end{array}$$

$$\begin{array}{l} -5 \times -5 = 25 \\ -5 + -5 = -10 \end{array}$$

$$\begin{array}{l} -9 \times -9 = 81 \\ -9 + -9 = -18 \end{array}$$

a)  $x^2 + 12x + 36$

b)  $x^2 - 10x + 25$

c)  $x^2 - 18x + 81$

$$(x+6)(x+6)$$

$$(x-5)(x-5)$$

$$(x-9)(x-9)$$

$$(x+6)^2$$

$$(x-5)^2$$

$$(x-9)^2$$

**Practice** - Find the value that should be placed in each blank in order to create a perfect square trinomial.

*(half it and square it)*

a)  $x^2 + 4x + \underline{4}$       b)  $x^2 - 8x + \underline{16}$       c)  $x^2 - 14x + \underline{49}$

d)  $x^2 - 2x + \underline{1}$       e)  $x^2 - 3x + \underline{\frac{9}{4}}$       f)  $d^2 + 9d + \underline{\frac{81}{4}}$

g)  $a^2 + \underline{20}a + 100$       h)  $q^2 - \underline{22}q + 121$       i)  $p^2 - \underline{\frac{22}{7}}p + \frac{121}{49}$

e)  $x^2 - 3x + \underline{\quad}$       f)  $d^2 + 9d + \underline{\quad}$       i)  $\frac{\sqrt{121}}{\sqrt{49}}$

$-3 \times \frac{1}{2}$        $9 \times \frac{1}{2}$        $\frac{11}{7} \times \frac{2}{1}$

$\left(\frac{-3}{2}\right)^2$        $\left(\frac{9}{2}\right)^2$        $\frac{22}{7}$

$\frac{9}{4}$        $\frac{81}{4}$

### Example

Change to Transformational Form:  $y = 2x^2 - 8x + 5$  General Form

#### Step 1

$$y - 5 = 2x^2 - 8x$$

#### Step 2

$$y - 5 = 2(x^2 - 4x)$$

#### Step 3

$$y - 5 + 8 = 2(x^2 - 4x + 4)$$

$-4x \cdot \frac{1}{2} = (-2)^2 = 4$

#### Step 4

$$y + 3 = 2(x - 2)^2 \rightarrow y = 2(x - 2)^2 - 3$$

(Standard)

#### Step 5

$$\frac{1}{2}(y + 3) = (x - 2)^2$$

(Transformational)

$$\textcircled{1} \quad y = x^2 + 14x + 50$$

$$14x \frac{1}{2} = (\underline{7})^2 = 49$$

$$y - 50 + 49 = x^2 + \underline{14}x + 49$$

$$y - 1 = (x + \underline{7})^2 \quad (\text{Transformational})$$

$$y = (x + 7)^2 + 1 \quad (\text{Standard})$$