

Do you remember?
Completing the square review

Directions: Complete the square to change each quadratic from standard form to vertex form.

1. $y = x^2 + 6x + 16$

$$y - 16 = x^2 + 6x$$

$$y - 16 + \boxed{9} = x^2 + 6x + \boxed{9}$$

$$y - 7 = (x + 3)(x + 3)$$

$$\boxed{y = (x + 3)^2 + 7}$$

2. $y = x^2 - 8x + 24$

$$y - 24 = x^2 - 8x$$

$$y - 24 + \boxed{16} = x^2 - 8x + \boxed{16}$$

$$y - 8 = (x - 4)(x - 4)$$

$$\boxed{y = (x - 4)^2 + 8}$$

Try these on your own

Complete the square to change each quadratic from standard form to vertex form.

3. $y = x^2 + 24x + 129$

$$y - 129 = x^2 + 24x$$

$$y - 129 + \boxed{144} = x^2 + 24x + \boxed{144}$$

$$y + 15 = (x + 12)^2$$

$$\boxed{y = (x + 12)^2 - 15}$$

4. $y = x^2 - 10x + 24$

$$y - 24 = x^2 - 10x$$

$$y - 24 + \boxed{25} = x^2 - 10x + \boxed{25}$$

$$y + 1 = (x - 5)^2$$

$$\boxed{y = (x - 5)^2 - 1}$$

5. $y = x^2 - 14x + 9$

$$y - 9 = x^2 - 14x$$

$$y - 9 + \boxed{49} = x^2 - 14x + \boxed{49}$$

$$y + 40 = (x - 7)^2$$

$$\boxed{y = (x - 7)^2 - 40}$$

+4

6. $y = x^2 + 6x - 18$

$$y + 18 = x^2 + 6x$$

$$y + 18 + \boxed{9} = x^2 + 6x + \boxed{9}$$

$$y + 27 = (x + 3)^2$$

$$\boxed{y = (x + 3)^2 - 27}$$

7. $y = x^2 + 18x - 19$

$$y + 19 = x^2 + 18x$$

$$y + 19 + \boxed{81} = x^2 + 18x + \boxed{81}$$

$$y + 100 = (x + 9)^2$$

$$\boxed{y = (x + 9)^2 - 100}$$

8. $y = x^2 - 3x - 4$

$$y + 4 = x^2 - 3x \quad b = -3$$

$$y + 4 + \boxed{\frac{9}{4}} = x^2 - 3x + \boxed{\frac{9}{4}} \quad \frac{b}{2} = \frac{-3}{2}$$

$$y + \frac{25}{4} = (x - \frac{3}{2})^2 \quad \left(\frac{b}{2}\right)^2 = \frac{9}{4}$$

$$\boxed{y = (x - \frac{3}{2})^2 - \frac{25}{4}}$$