


# Unit 7 Obj. 6 – Converting from the General Form to the Descriptive Form of a Parabola

Ex. #1:  $y = 3x^2 + 24x + 7$

$$\begin{aligned}y - 7 &= 3x^2 + 24x \\y - 7 &= 3(x^2 + 8x) \\y - 7 &= 3\left(x^2 + 8x + \frac{16}{3}\right) \\+ 48 &\quad \quad \quad \downarrow \quad \nearrow \\ &\quad \quad \quad (4)^2\end{aligned}$$

$$\begin{aligned}y + 41 &= 3(x + 4)^2 \\ \boxed{y} &= \boxed{3(x + 4)^2 - 41}\end{aligned}$$

  
Vertex:  $(-4, -41)$



**Ex. #2:  $x = -5y^2 + 20y - 11$**



vertex:  $(9, 2)$

$$x + 11 = -5y^2 + 20y$$

$$x + 11 = -5\left(y^2 - 4y + \frac{4}{-2}\right)$$

-20

$$(-2)^2$$

$$x - 9 = -5(y - 2)^2 + 9$$

$x = -5(y - 2)^2 + 9$



**Ex. #3:**  $y = -\frac{1}{4}x^2 - 3x + 5$



Vertex:  $(-6, 14)$

$$y - 5 = -\frac{1}{4}x^2 - 3x$$

$$y - 5 = -\frac{1}{4}(x^2 + 12x)$$

$$y - 5 = -\frac{1}{4}\left(x^2 + 12x + \frac{36}{4}\right)$$

-9                       $(6)^2$  ↗

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$$y - 14 = -\frac{1}{4}(x + 6)^2$$

$$y = -\frac{1}{4}(x + 6)^2 + 14$$

