Recall. **Theorem.** \( x^2 + ax = (x + \frac{a}{2})^2 - (\frac{a}{2})^2 \)

3. \( y = 2(x + 4)^2 - 3 \). Rewrite in the completed-square form \( a(x - x_0)^2 + y_0 \). Hint, \( x_0, y_0 \) can be negative

3. \( y = 2x^2 + 8x + 3 \). Find the vertex, intercepts, graph.

Do the “horns” of the parabola point up \( \cup \) or down \( \cap \) ?

Leave the constant 3 alone. Factor the 2 out of \( (2x^2 + 8x) \) then complete the square using the theorem above.

If your equation looks like \( a(x + x_0)^2 - y_0 \), rewrite it in the completed-square form \( a(x - x_0)^2 + y_0 \).

vertex =

You must use “( )”. E.g., vertex=(3,4), not vertex = 3,4. 7 symbols.

x-intercept(s)? Set \( y = 0 \).

Either factor \( 2x^2 + 8x + 3 \) or, if not possible, use the quadratic formula \( x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a} \) or set the completed square form equal to 0. No roots if the radical is undefined.

7 or 8 symbols counting \( \pm \) as 1 symbol. chk=5 or 7 or 9.

y-intercept? Equation has 3 symbols

Draw the graph. Label the vertex with its coordinates.