Writing a Quadratic Equation in Vertex Form

1. Write the original function.
2. Working with the $(x^2 + bx)$ part, factor out "a" and prepare to complete the square.
3. Add the appropriate number to complete the square.
4. Write the PST as a binomial squared.
5. Solve for y. Identify the vertex.

$y = x^2 - 4x - 1$

$y = (x^2 - 4x) - 1$

$y = (x^2 - 4x + 4) - 1 - 4$

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

vertex: $(2, -5)$

Write $y = 5x^2 + 10x + 7$ in vertex form. Identify the vertex.

$y = (5x^2 + 10x) + 7$

$y = 5(x^2 + 2x) + 7$

$y = 5(x^2 + 2x + 1) + 7 - 5$

Really... this is adding 5

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

vertex: $(-1, 2)$

due Wed.

43.) $y = x^2 + 12x + 37$

$y = (x^2 + 12x) + 37$

$y = (x^2 + 12x + 36) + 37 - 36$

$y = (x+6)^2 + 1$ vertex: $(-6, 1)$

47.) $y = 2x^2 + 24x + 25$

$y = (2x^2 + 24x) + 25$

$y = 2(x^2 + 12x) + 25$

$y = 2(x^2 + 12x + 36) + 25 - 72$ (36·2)

$y = 2(x+6)^2 - 47$

vertex: $(-6, -47)$

p. 289/ #41-51, 62-65, 69, 71, 73