Algebra 2 Do Something Awesome

Name Key

Standard Form to Vertex Form

Date _____ Hour ____

Write each equation in vertex form. Then identify the vertex and describe the transformation.

1) $f(x) = x^2 + 8x + 17$ $(\frac{8}{2})^2 = 4^2 = 16$

$(x^2+8x+16) - 16 + 17$

$f(x) = (x+4)^2 + 1$

$(-4, 1)$ Shifts left 4, up 1

$x = -4$

2) $f(x) = x^2 - 6x + 13$ $(\frac{-6}{2})^2 = (-3)^2 = 9$

$(x^2-6x+9) - 9 + 13$

$f(x) = (x-3)^2 + 4$

$(3, 4)$ Shifts right 3, up 4

$x = 3$

3) $f(x) = x^2 + 8x + 18$ $(\frac{8}{2})^2 = 4^2 = 16$

$(x^2+8x+16) - 16 + 18$

$f(x) = (x+4)^2 + 2$

$(-4, 2)$ Shifts left 4, up 2

$x = -4$

4) $f(x) = x^2 - 4x + 5$ $(\frac{-4}{2})^2 = (-2)^2 = 4$

$(x^2-4x+4) - 4 + 5$

$f(x) = (x-2)^2 + 1$

$(2, 1)$ Shifts right 2, up 1

$x = 2$

5) $f(x) = x^2 - 2x + 5$ $(\frac{-2}{2})^2 = (-1)^2 = 1$

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

$f(x) = (x-1)^2 + 4$ Shifts right 1, up 4

$(1, 4)$

$x = 1$

6) $f(x) = x^2 - 6x + 8$ $(\frac{-6}{2})^2 = (-3)^2 = 9$

$(x^2-6x+9) - 9 + 8$

$f(x) = (x-3)^2 - 1$

$(3, -1)$ Shifts right 3, down 1

$x = 3$

7) $f(x) = x^2 - 8x + 15$ $(\frac{-8}{2})^2 = (-4)^2 = 16$

$(x^2-8x+16) - 16 + 15$

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

$(4, -1)$ Shifts right 4, down 1

$x = 4$

8) $f(x) = x^2 + 8x + 13$ $(\frac{8}{2})^2 = 4^2 = 16$

$(x^2+8x+16) - 16 + 13$

$f(x) = (x+4)^2 - 3$

$(-4, -3)$ Shifts left 4, down 3

$x = -4$

9) $f(x) = x^2 + 2x - 2$ $\left(\frac{2}{2}\right)^2 = 1^2 = 1$

$(x^2+2x+1)-1-2$

$f(x) = (x+1)^2 - 3$

$(-1,-3)$

$x=-1$

10) $f(x) = x^2 + 2x + 2$

$(x^2+2x+1)-1+2$

$f(x) = (x+1)^2 + 1$

$(-1,1)$

$x=-1$

11) $f(x) = x^2 - 8x + 12$

$(x^2-8x+16)-16+12$

$f(x) = (x-4)^2 - 4$

$(4,-4)$

$x=4$

12) $f(x) = x^2 + 8x + 14$

$(x^2+8x+16)-16+14$

$f(x) = (x+4)^2 - 2$

$(-4,-2)$

$x=-4$

13) $f(x) = x^2 - 8x + 18$

$(x^2-8x+16)-16+18$

$f(x) = (x-4)^2 + 2$

$(4,2)$

$x=4$

14) $f(x) = x^2 + 4x + 1$

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

$f(x) = (x+2)^2 - 3$

$(-2,-3)$

$x=-2$

15) $f(x) = x^2 - 2x$

$(x^2-2x+1)-1$

$f(x) = (x-1)^2 - 1$

$(1,-1)$

$x=1$

16) $f(x) = x^2 + 6x + 13$

$(x^2+6x+9)-9+13$

$f(x) = (x+3)^2 + 4$

$(-3,4)$

$x=-3$