a. $(x+4)(x+2)$

$x=-4 \quad x=-2$

$\frac{-4+-2}{2} = \frac{-6}{2}$

$x=-3$

$y=((-3)+4)((-3)+2)$

$(1)(-1)$

-1

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

Write each of the equations in vertex form. $y=(x+4)^2-1$

a. $f(x) = (x+4)(x+2)$

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

b. $f(x) = x^2 + 8x + 15$

c. $f(x) = (x+6)(x-4)$

$y=(x+1)^2-25$

d. $f(x) = x^2 - 18x + 80$

$y=(x-9)^2-1$

e. $f(x) = (x + 5)(x - 3)$

$y=(x+1)^2-16$

f. $f(x) = x^2 - 6x - 27$

$y=(x-3)^2-36$

1. Explain why we add the x intercepts together and divide by 2 to get the x value of the vertex.
2. Explain how we use the x value of the vertex to solve for the y value.

① x-value of the
The ^ vertex is located ½-way in between the x-intercepts. Adding the x-intercepts together and dinding by 2 gives us the middle value.

② We plug in the x-value of the vertex to the orginal equation to solve for y. This gives us the y value of the vertex.