Deriving the quadratic equation

There will be a proof on the final exam.

$$ax^2 + bx + c = 0$$

$$a\left(x^2 + \frac{b}{a}x\right) + c = 0$$

Consider (completing the square):

$$\frac{b}{a} \div 2 = \frac{b}{2a}$$

$$\left(\frac{b}{2a}\right)^2 = \frac{b^2}{4a^2}$$

$$a\left(x^2 + \frac{b}{a} + \frac{b^2}{4a^2} - \frac{b^2}{4a^2}\right) + c = 0$$

$$a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2}{4a} + c = 0$$

$$a\left(x + \frac{b}{2a}\right)^2 - \frac{b^2 - 4ac}{4a} = 0$$

$$a\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a}$$

$$\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$$

$$x + \frac{b}{2a} = \mp\sqrt{\frac{b^2 - 4ac}{4a^2}}$$

$$x = -\frac{b}{2a} \mp \sqrt{\frac{b^2 - 4ac}{4a^2}}$$

Consider (simplify):

$$4a^2 = 2a$$

$$x = -\frac{b}{2a} \mp \sqrt{\frac{b^2 - 4ac}{2a}}$$

$$\therefore \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Open Questions:

Question 1:
Domain of $y = -\sqrt{x + 3}$
$x + 3 \geq 0$
$x \geq -3$
$dom = [-3, \infty]$

Question 2:
$f(x) = x^2 - 2x$
$f(x + \Delta x) = (x + \Delta x)^2 - 2(x + \Delta x)$
$x^2 + 2x\Delta x + \Delta x^2$
$-2x - 2\Delta x$

Format for assignment:

Make sure it's neat, stapled.
Answers have to be in order, and in whole number form.

Assignment is handed in at Ryan Building, there's mailboxes there. Assignment 1 is due on Friday (Sept. 16th 2016).