

- b. For what ticket price does the committee expect an income of zero?
- c. What ticket price will generate the greatest income? How much income is expected at that ticket price?
- d. Use your answers to Parts b and c to sketch a graph of $I = -75p^2 + 950p$.

Adding a Linear Term

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

$$y = x^2 + 5$$

$$y = x^2 + 4x$$

$$x(x+4)$$

$$x=0 \quad x+4=0$$

$$x=-4$$

5. Study the tables and graphs produced by such functions for several combinations of positive and negative numbers.

Set 1

$$y = x^2$$

$$y = x^2 + 4x$$

Left

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

Right

Set 2

$$y = -x^2$$

$$y = -x^2 + 5x$$

Right

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

Left

Set 3

$$y = 2x^2$$

$$y = 2x^2 + 6x$$

Left

$$y = 2x^2 - 6x$$

Right

$$-x(x-5)$$

$$x=0 \quad x-5=0$$

$$x=5$$

Look at the graphs of the functions given above to see if you can find patterns that relate the values of a and b in the rules $y = ax^2 + bx$ to locate the features below. It may help to think about the functions using the equivalent factored form, $x(ax + b)$.