

How do the solutions to the system relate to the graphs of the two functions in the system?

Let's solve by graphing to find out!

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

$$g(x) = x$$

In looking at the structure of the quadratic function, we can see that it will factor. Factoring gives us an easy method for finding the x -intercepts.

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

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

Example 2)

Solve the following system of equations both algebraically and graphically:

$$f(x) = x$$

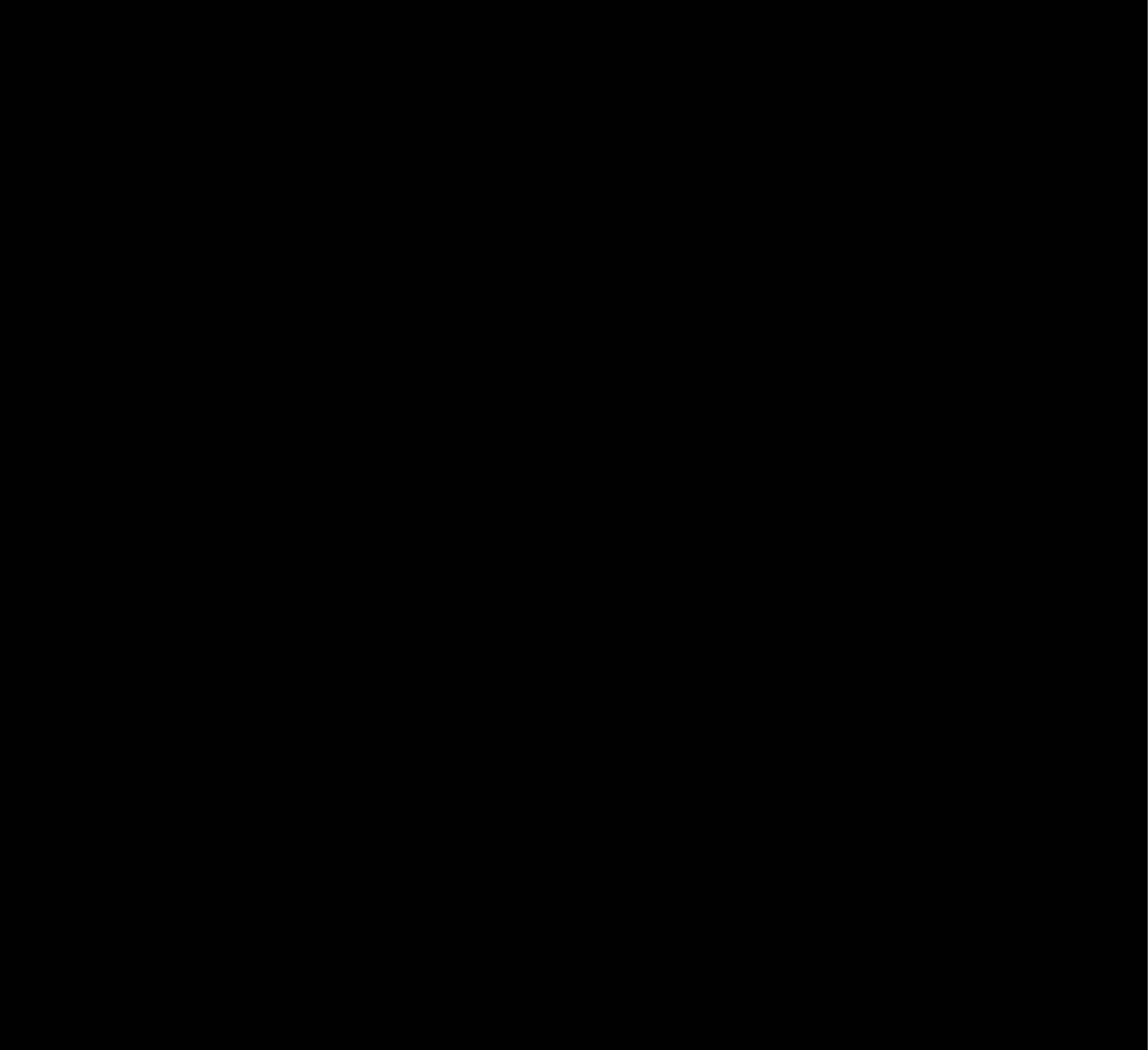
$$g(x) = x^2 + 8x + 12$$

$$y = x^2 + 8x + 12$$

$$-2x - 13 = x^2 + 8x + 12$$

$$0 = x^2 + 10x + 25$$

$$0 = (x + 5)^2$$



Answers to warm-up:

Quadrant I

Substitution Method:

$$= x +$$

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$$2x + 4 = x + 3$$

$$2x - x + 4 = x - x + 3$$

$$x + 4 = 3$$

$$x + 4 - 4 = 3 - 4$$

$$x = -1$$

Using the equation $y = 2x + 4$:

$$y = 2x + 4$$

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

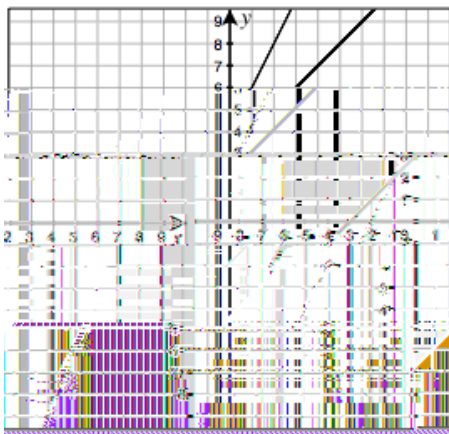
$$y = -2 + 4$$

$$y = 2$$

the solution to the system is the ordered pair $(-1, 2)$.

Graphical Method:

Graph of the system:



\therefore the solution to the system is the ordered pair $(-1, 2)$.

Quadrant II

Which equations can be used to find a root of