Chapter 8: Systems of Equations

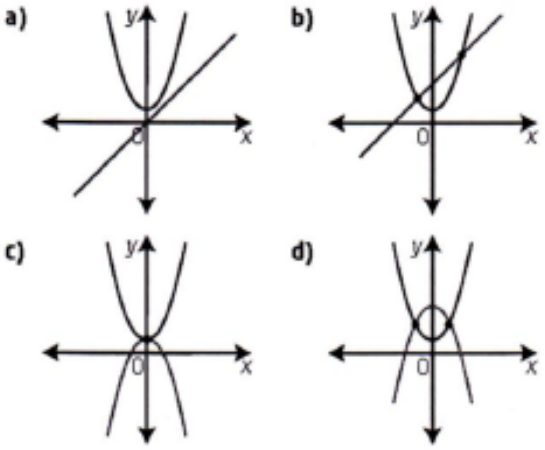
1. Examine each system of equations and ***match it*** with a possible sketch of the system. You do not need to solve the systems to match them.

I) $y = x^2 + 1$, $y = -x^2 + 1$ ____c____

II) $y = x^2 + 1$, $y = x$ ____a____

III) $y = x^2 + 1$, $y = -x^2 + 4$ _____d____

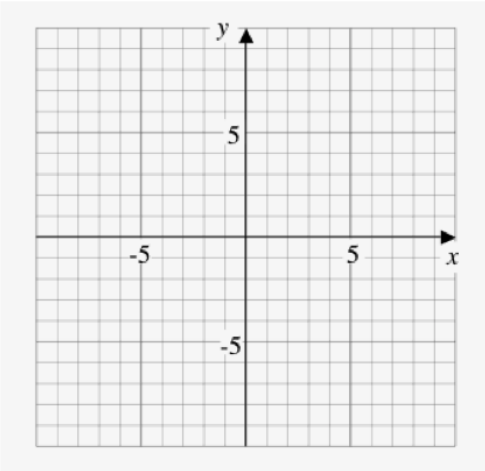
IV) $y = x^2 + 1$, $y = x + 4$ _____b____



2. Solve the system of linear-quadratic equations graphically. Express your answer(s) to the nearest te

$3x + y = 4$

$y = x^2 - 3x - 1$



(2.2,-2.7) and (-2.2,10.7)

3. Given the quadratic function $y = x^2 + 4$ and the linear function $y = x + b$, determine all the possible values of *b* that would result in a system of equations with:

a) two solutions
b) exactly one solution
c) no solution

a) b > 4 **b) b = 4** **c) b < 4**

4. The price, *P*, in dollars, per share, of a high0tech stock has fluctuated over a 10-year period according to the equation $P = 14 + 12t - t^2$, where *t* is time, in years. The price of a second high-tech stock has shown a steady increase during the same time period according to the relationship $P = 2t + 30$. Algebraically determine for what values the two stock prices will be the same.

$34 and $46

5. Explain how you could determine if the given system of quadratic-quadratic equations has zero, one, two, or an infinite number of solutions without solving or using technology.

$$y = (x-4)^2 + 2$$
$$y = -(x+3)^2 - 1$$

Compare vertices and opening directions. Never cross -> no solution.

6. Algebraically determine the solution(s) to each system of quadratic-quadratic equations.

a)
$$y = 2x^2 + 9x - 5$$
$$y = 2x^2 - 4x + 8$$

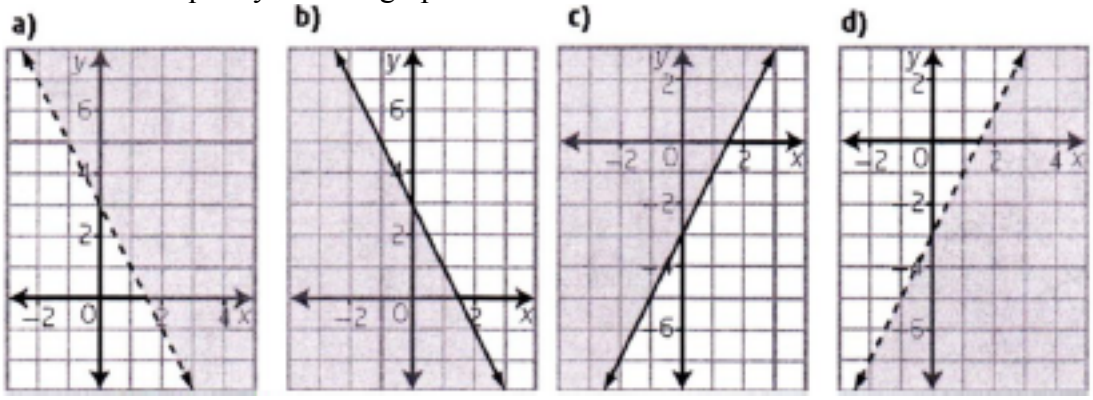
(1,6)

b)
$$y = 12x^2 + 17x - 5$$
$$y = -x^2 + 30x - 5$$

(0,-5) and (1,24)

Chapter 9: Linear & Quadratic Inequalities

7. Match each inequality with its graph.

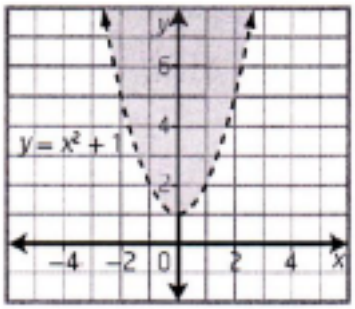


I) $2x + y < 3$ ____a___ **II)** $2x - y \leq 3$ ___c____

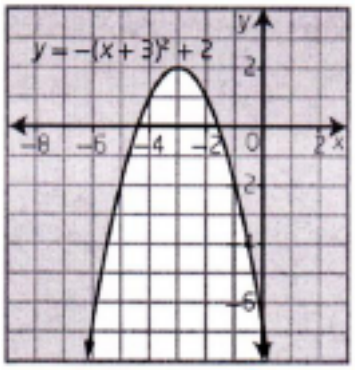
III) $2x - y \geq 3$ ____b___ **IV)** $2x + y > 3$ ____d___

8. Write an inequality to describe each graph, given the function defining the boundary parabola.

a) **$y > x^2+1$**



b) **$y >= -(x+3)^2+2$**



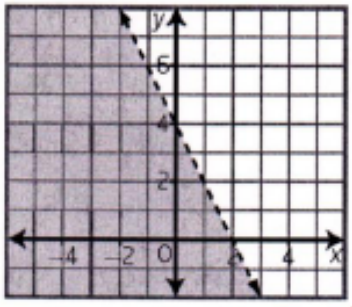
9. Explain how each test point can be used to determine the solution region that satisfies the inequality $y > x - 2$

Plug in

a) (0, 0) **b)** (2, -5) **c)** (-1, 1)

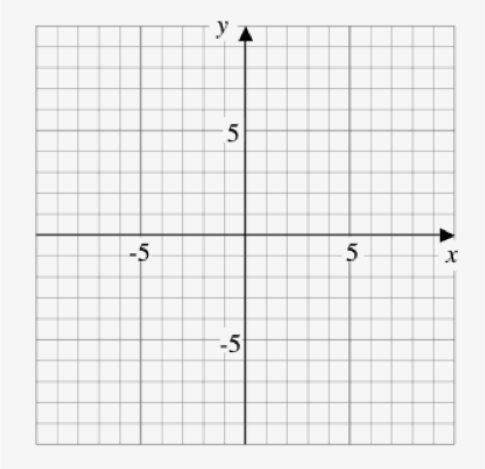
yes **no** **yes**

10. What linear inequality is shown in the graph?



y < -2x+4

11. Sketch the graph of $y < x^2 - 6x + 5$. Use a test point to verify the solution region.



dotted, shade below (use graph calc if desired)

12. Use sign analysis to determine the solution of the quadratic inequality $2x^2 + 9x - 37 \geq 2$.

$x \leq \frac{-9-\sqrt{393}}{4}$ and $x \geq \frac{-9+\sqrt{393}}{4}$

13. Suppose a rectangular area of land is to be enclosed by 1000 m of fence. If the area is to be greater than 60 000 m^2, what is the range of possible widths of the rectangle?

Width is in between 200 m and 300 m