

**Solving Quadratic Inequalities**

1. Solve each of the following quadratics using a number line.

a.  $x^2 + 4x - 5 < 0$

b.  $x^2 + 4x + 3 > 0$

c.  $3x^2 + 10x - 8 \leq 0$

d.  $8x^2 - 6x \geq -1$

2. Solve each of the following quadratics using a number line.

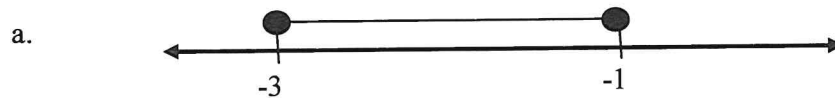
a.  $x^2 - 6 < 0$

b.  $x^2 + 4x > 0$

c.  $(x - 3)^2 + 5 \leq 0$

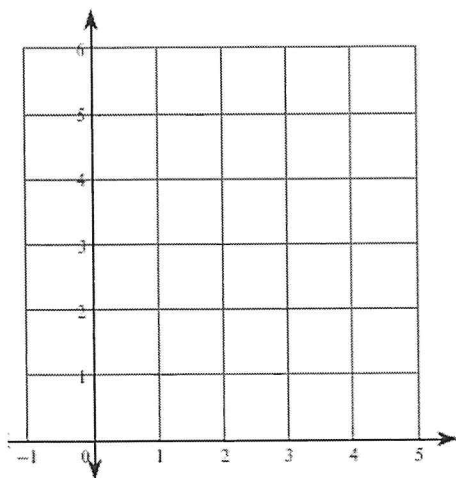
d.  $2x^2 - 3x - 3 \geq 0$

3. Write a quadratic inequality statement that represents each of the following solutions.

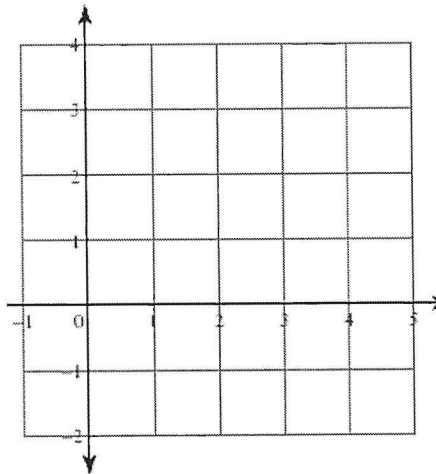


4. Solve the following quadratic inequalities by graphing.

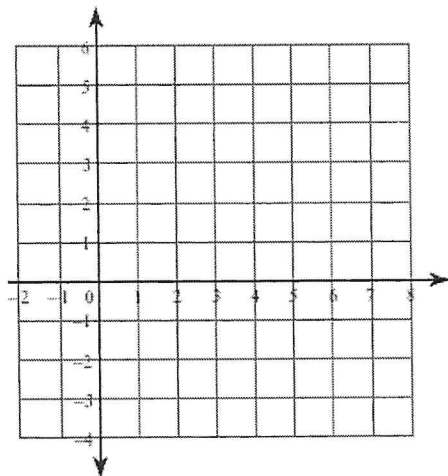
$$y \leq x^2 - 4x + 5$$



$$y < (x - 2)^2 - 1$$



$$y \geq 2x^2 - 8x + 5$$



5. Determine if the point  $(-3, 2)$  is a solution to any of the following quadratic inequalities.

a.  $y < 2(x - 1)^2 + 5$

b.  $y > -3(x - 4)^2 - 1$

c.  $y \leq \frac{1}{3}(x - 3)^2 - 5$

d.  $y \geq -\frac{1}{2}(x + 4)^2 - 2$

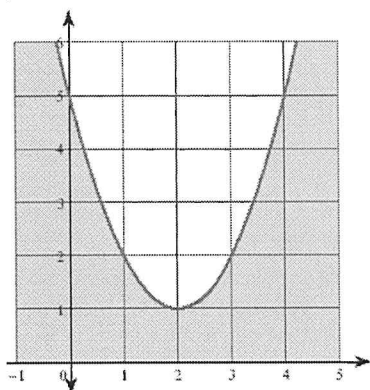
**ANSWERS**

- 1a.  $-5 < x < 1, x \in R$
- 1b.  $x < -3$  or  $x > -1, x \in R$
- 1c.  $-4 \leq x \leq \frac{2}{3}, x \in R$
- 1d.  $\frac{1}{4} \geq x$  or  $x \geq \frac{1}{2}, x \in R$

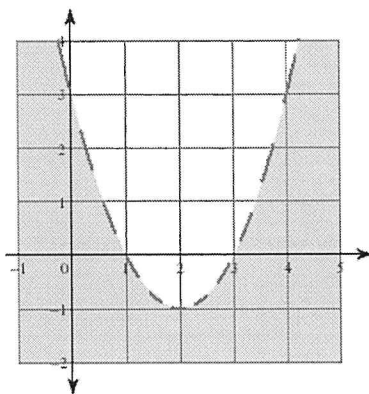
- 2a.  $-\sqrt{6} < x < \sqrt{6}, x \in R$
- 2b.  $-4 > x$  or  $x > 0, x \in R$
- 2c. no solution
- 2d.  $\frac{3 - \sqrt{33}}{4} \geq x$  or  $x \geq \frac{3 + \sqrt{33}}{4}, x \in R$

- 3a.  $x^2 + 4x + 3 \leq 0$
- 3b.  $x^2 - 8x - 9 > 0$
- 3c.  $8x^2 - 10x + 3 \geq 0$

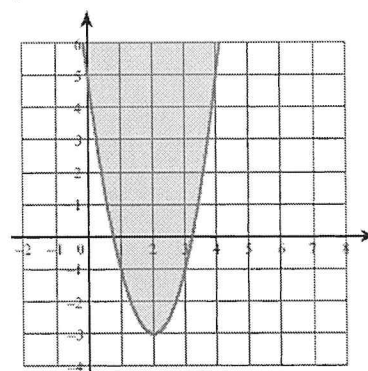
4.  
 $y \leq x^2 - 4x + 5$



$y < (x - 2)^2 - 1$



$y \geq 2x^2 - 8x + 5$



- 5a. yes    5b. yes    5c. yes    5d. yes