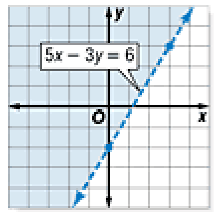
Lesson 2–7

Example 1 Dashed Boundary

Graph $5x - 3y < 6$.

The boundary is the graph of $5x - 3y = 6$. Since the inequality symbol is <, the boundary will be dashed. Use the slope–intercept form, $y = \frac{5}{3}x - 2$, to graph the boundary line.

Now test the point (0, 0). The point (0, 0) is usually a good point to test because it results in easy calculations.



$5x - 3y < 6$		Original inequality
$5(0) - 3(0) < 6$		$(x, y) = (0, 0)$
$0 < 6$		true

Shade the region that contains (0, 0).

Example 2 Solid Boundary

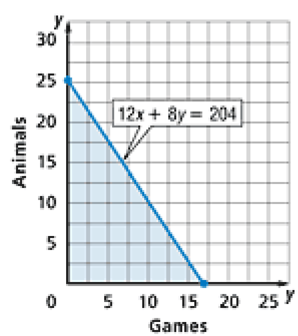
FUND–RAISING The Peerless High School Student Council is planning a raffle. They have chosen two different types of prizes to purchase, games for $12 each and stuffed animals for $8 each.

a. Write an inequality to describe the total cost of the prizes if the student council wants to spend no more than $204.

Let x be the number of games and let y be the number of stuffed animals. Since the student council can spend *at most* $204 for the raffle, use a ≤ symbol. The inequality is $12x + 8y \leq 204$.

b. Graph the inequality.

Since the inequality symbol is ≤ , the graph of the related linear equation $12x + 8y = 204$ is solid.



Test (0, 0).

$12x + 8y \leq 204$	Original inequality
$12(0) + 8(0) \stackrel{?}{\leq} 204$	$(x, y) = (0, 0)$
$0 \leq 204$	true

Shade the region that contains (0, 0). Since the variables cannot be negative, shade only the part in the first quadrant.

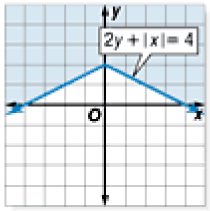
c. If the student council wants to spend exactly $204, what number of each can they buy?

There are several possibilities. One is 15 games and 3 animals since $12(15) + 8(3) = 204$.

Example 3 **Absolute Value Inequality**

Graph $2y + |x| \geq 4$.

Since the inequality symbol is ≥, the graph of the related equation $2y + |x| = 4$ is solid. Graph the equation.



Test (0, 0).

$2y + \|x\| \geq 4$	Original inequality
$2(0) + \| 0 \| \geq 4$	$(x, y) = (0, 0)$
$0 + 0 \geq 4$	$\| 0 \| = 0$
$0 \geq 4$	false

Shade the region that does not include (0, 0).