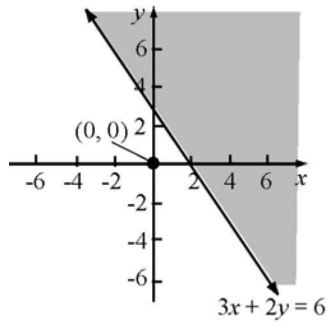
ALL QUESTION NUMBERS ARE 3 LESS: SO 13 = 16

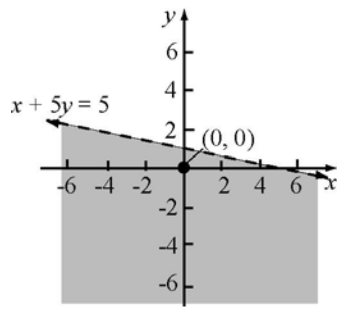
13. The corresponding linear equation is $3x + 2y = 6$. We graph a solid line, since the inequality is nonstrict. The test point (0, 0) does not satisfy the inequality, so we shade the region opposite it.

$$\begin{aligned} 3x + 2y &\geq 6 \\ 3 \cdot 0 + 2 \cdot 0 &= 0 \\ 0 &< 6 \end{aligned}$$



16. The corresponding linear equation is $x + 5y = 5$. We graph a dashed line, since the inequality is strict. The test point (0, 0) satisfies the inequality, so we shade the region containing it.

$$\begin{aligned} x + 5y &< 5 \\ 0 + 5 \cdot 0 &= 0 \\ 0 &< 5 \end{aligned}$$



19. To determine which points are part of the graph of the system, check each point to see if it satisfies all of the inequalities:

Point	Inequality 1	Inequality 2	Conclusion
$P_1 = (9, -5)$	Is $9 + 4 \cdot (-5) \leq 0$? $-11 < 0$	Is $5 \cdot 9 + 2 \cdot (-5) \geq 0$? $35 > 0$	Both inequalities are satisfied; (9, –5) is part of the graph.
$P_2 = (12, -4)$	Is $12 + 4 \cdot (-4) \leq 0$? $-4 < 0$	Is $5 \cdot 12 + 2 \cdot (-4) \geq 0$? $52 > 0$	Both inequalities are satisfied; (12, –4) is part of the graph.
$P_3 = (4, 1)$	Is $4 + 4 \cdot (1) \leq 0$? $8 > 0$		The first inequality is not satisfied, so (4, 1) is not part of the graph.

24. The region that represents the graph of the system is the set of points common to the solutions of each individual inequality. We use the test point (0, 0).

$$\begin{aligned} 2x - 3y &\geq -3 \\ 2 \cdot 0 - 3 \cdot 0 &= 0 \\ 0 &> -3 \end{aligned} \qquad \begin{aligned} 2x + 3y &\leq 16 \\ 2 \cdot 0 + 6 \cdot 0 &= 0 \\ 0 &< 16 \end{aligned}$$

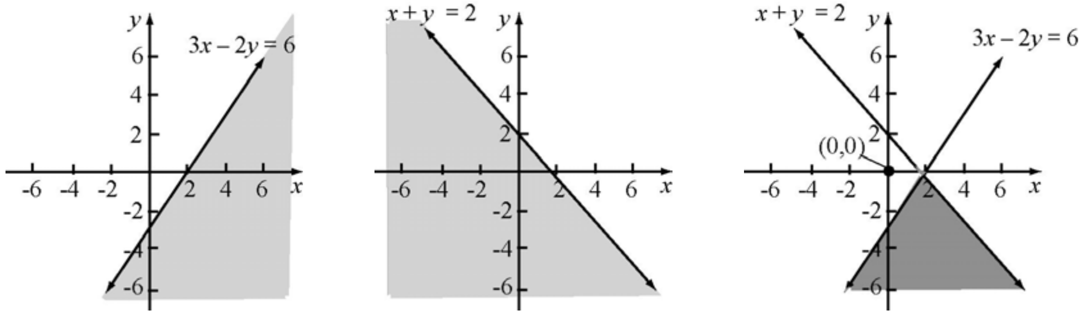
The test point (0, 0) satisfies both inequalities, so the region (***c***) represents the graph of the system.

27. The region that represents the graph of the system is the set of points common to the solutions of each individual inequality. We use the test point (0, 0).

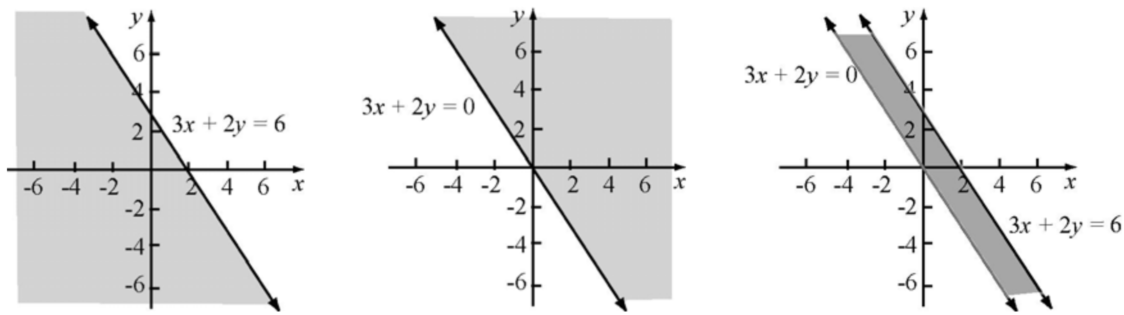
$$\begin{aligned} 5x - 5y &\geq 10 \\ 5\cdot 0 - 5\cdot 0 &= 0 \\ 0 &< 10 \end{aligned} \qquad \begin{aligned} 6x + 4y &\geq 48 \\ 6\cdot 0 + 4\cdot 0 &= 0 \\ 0 &< 48 \end{aligned}$$

The test point (0, 0) satisfies neither inequality, so the region representing each inequality is on the opposite side of the line from (0, 0). This means (***c***) represents the graph of the system.

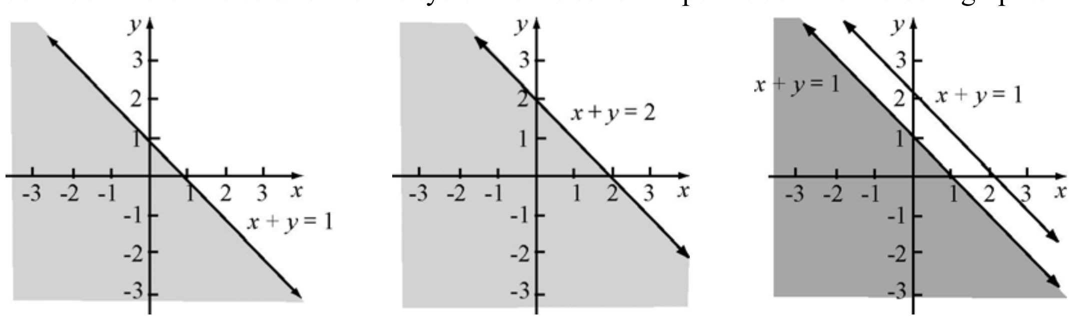
31. First graph each inequality separately. Then graph the lines with the points the separate graphs have in common. The solution to the system is the set of all points common to both graphs.



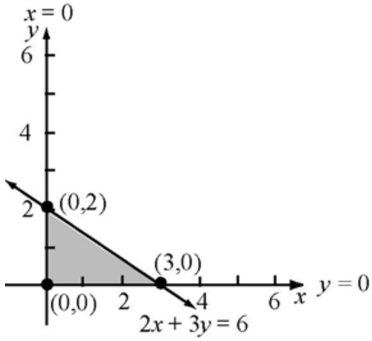
34. First graph each inequality separately. Then graph the lines with the points the separate graphs have in common. The solution to the system is the set of all points common to both graphs.



37. First graph each inequality separately. Then graph the lines with the points the separate graphs have in common. The solution to the system is the set of all points common to both graphs.

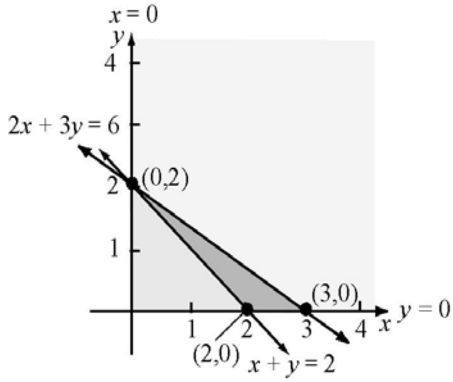


39. (a) $\begin{cases} 2x+3y \le 6 \\ x \ge 0 \\ y \ge 0 \end{cases}$



(b) The graph is bounded.
The corner points are:
(0, 0)
(0, 2)
(3, 0)

40. (a) $\begin{cases} x+y \ge 2 \\ 2x+3y \le 6 \\ x \ge 0 \\ y \ge 0 \end{cases}$



(b) The graph is bounded.
The corner points are:
(0, 2)
(2, 0)
(3, 0)