Tenth Set of Homework for Math 05

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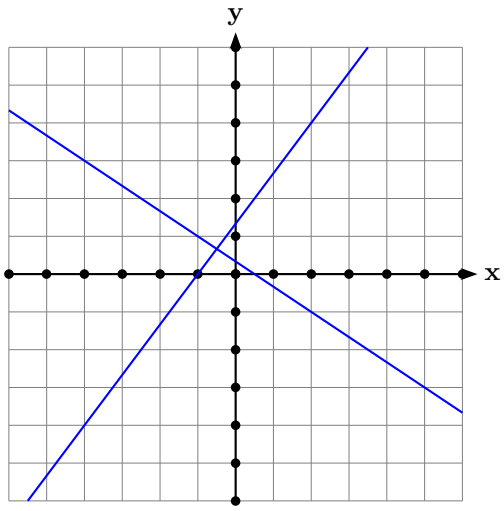
Please note: You should fully justify your answers.

1 Finding intersection points of lines

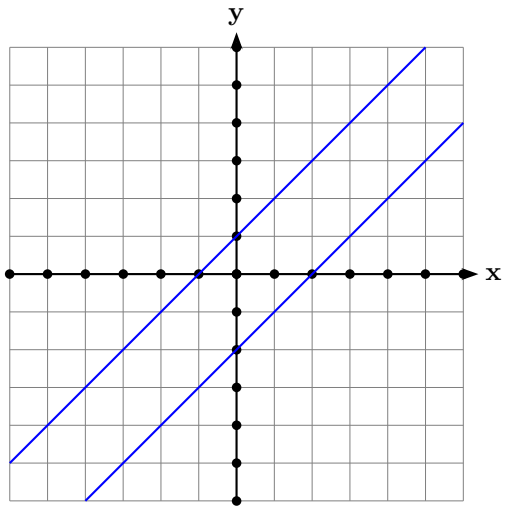
1. For each of the following pair of equations find the points of intersection:
   (a) $x = 5$, $y = -3$
   (b) $2x + 3y = 12$, $x = -3$
   (c) $5x - 12y = 6$, $y = -2$
   (d) $y = 3x - 1$, $6x - 2y = 11$
   (e) $-3x + 5y = 11$, $x = 5y - 14$
   (f) $2x - y = 4$, $y = -3x - 9$
   (g) $4x - 3y = -14$, $y = 2x + 5$
   (h) $y = x + 1$, $2x - 2y = -2$
   (i) $y = 2x + 3$, $y = 5x + 6$
2. Find the coordinates of the point of intersection for each of the pairs of lines shown in Figure 1.
3. The points $A(7, -1)$, $B(3, 3)$, $C(5, 7)$, and D are the corners of a parallelogram. Find the coordinates of the point D.

2 Solving Systems of linear equations

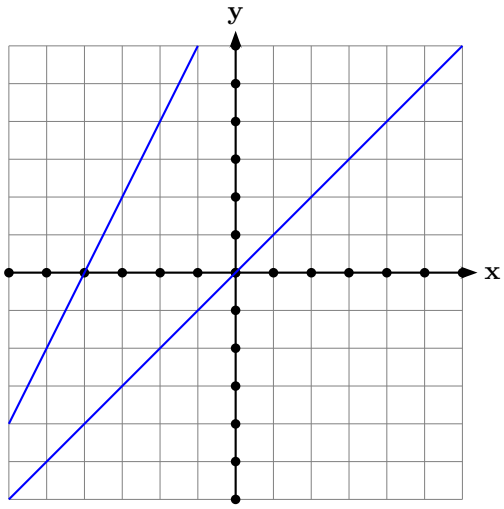
1. Solve the following systems.
   (a) $\begin{cases} x + y &= 10 \\ x - y &= 2 \end{cases}$
   (b) $\begin{cases} 2x + 5y &= 19 \\ -2x + 9y &= 23 \end{cases}$
   (c) $\begin{cases} 3x - 4y &= -27 \\ 3x + 2y &= -9 \end{cases}$
   (d) $\begin{cases} 2x + y &= 6 \\ 5x - 3y &= 26 \end{cases}$
   (e) $\begin{cases} 6x + 7y &= -33 \\ 3x - 5y &= 9 \end{cases}$
   (f) $\begin{cases} 7x - 3y &= 19 \\ -3x + 2y &= -1 \end{cases}$
   (g) $\begin{cases} 2x - 3y &= 7 \\ 4x - 6y &= -10 \end{cases}$
   (h) $\begin{cases} -4x + 7y &= 10 \\ 5x - 2y &= -10 \end{cases}$
   (i) $\begin{cases} 4x + 5y &= 10 \\ 12x + 15y &= 30 \end{cases}$



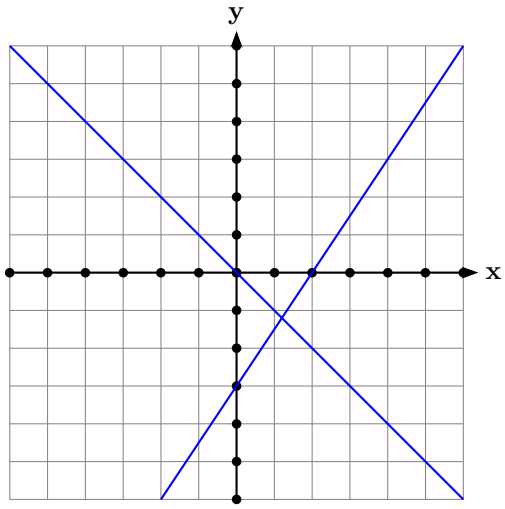
(a)



(b)



(c)



(d)

Figure 1: The lines of Question 2

(j) $\begin{cases} 5x + 4y &= -5 \\ 2x - 7y &= -45 \end{cases}$

(k) $\begin{cases} 3x - 6y &= 10 \\ 2x - 8y &= 25 \end{cases}$

2. Can you solve the following system of three linear equations with three unknowns?

$$\begin{cases} 7x - 3y + 2z &= -25 \\ -3x + 2y + 3z &= 35 \\ x + y + z &= 10 \end{cases}$$