

SOLVING LINEAR SYSTEMS OF EQUATIONS BY GRAPHING

Solve each linear system graphically. Remember, **rearrange** the equations into $y = mx + b$ form to graph the lines first. **Don't forget to CHECK your solution.**

a) $-x + y = 4$ and $3x - y = 0$

$$y = x + 4$$

$$m = \frac{1}{1}$$

$$b = 4$$

$$-y = -3x + 0$$

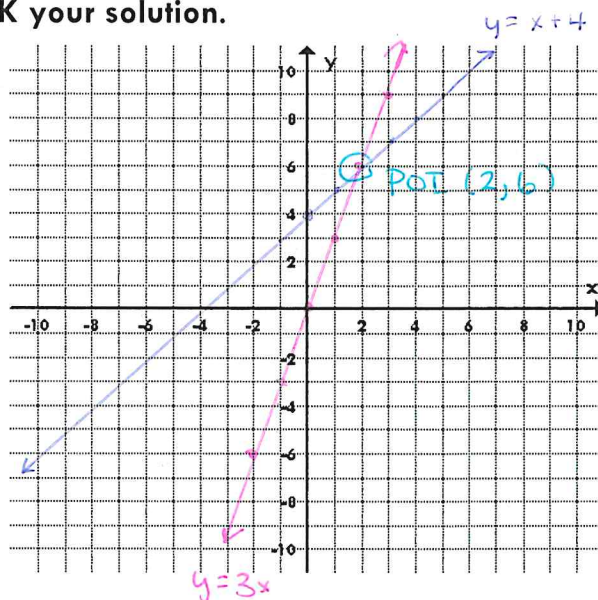
$$y = 3x + 0$$

$$m = \frac{3}{1} \quad b = 0$$

Check: $(2, 6)$

LS	RS
$-x + y$	4
$-(2) + (6)$	
$-2 + 6$	4
	✓

LS	RS
$3x - y$	0
$3(2) - (6)$	
$6 - 6$	0
	✓



b) $y = x + 5$ and $4x + y - 10 = 0$

$$m = \frac{1}{1}$$

$$b = 5$$

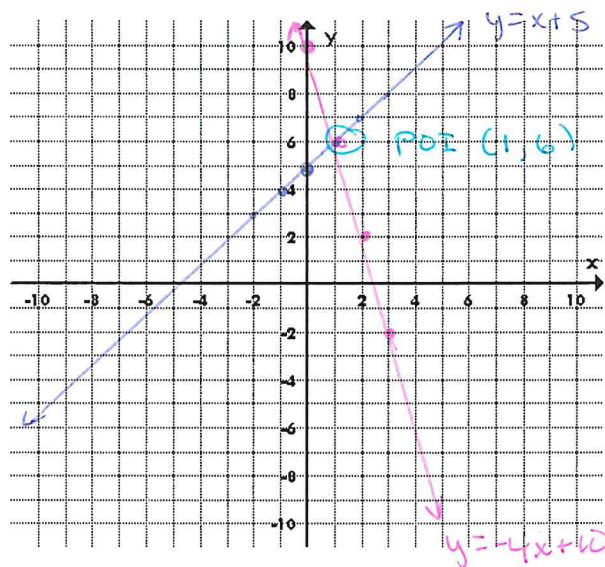
$$y = -4x + 10$$

$$m = -\frac{4}{1} \quad b = 10$$

Check: $(1, 6)$

LS	RS
y	$x + 5$
(6)	$(1) + 5$
6	6
	✓

LS	RS
$4x + y - 10$	0
$4(1) + (6) - 10$	
$4 + 6 - 10$	0
	✓



c) $3y - 2x = 12$ and $y - \frac{4}{3}x - 6 = 0$

$$\frac{3y}{3} = \frac{2x}{3} + \frac{12}{3}$$

$$y = \frac{2}{3}x + 4$$

$$m = \frac{2}{3} \quad b = 4$$

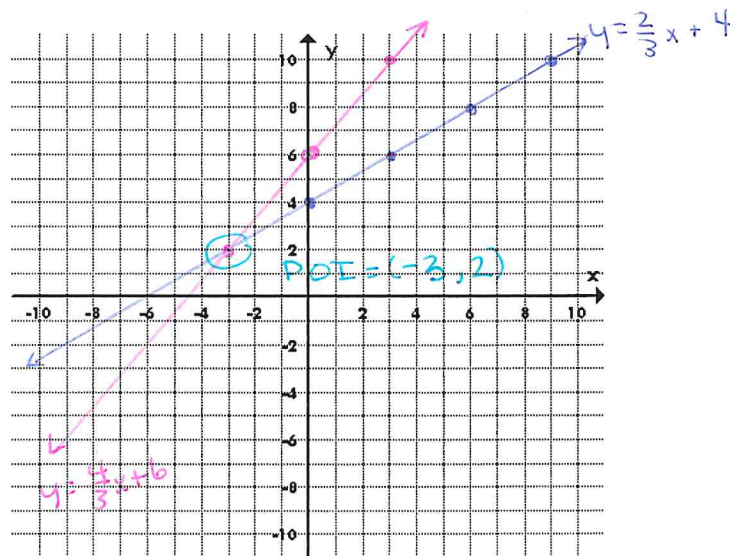
Check: $(-3, 2)$

$$y = \frac{4}{3}x + 6$$

$$m = \frac{4}{3} \quad b = 6$$

LS	RS
$3y - 2x$	12
$= 3(2) - 2(-3)$	
$= 6 + 6$	
$= 12$	

LS	RS
$y - \frac{4}{3}x - 6$	0
$(2) - \frac{4}{3}(-3) - 6$	
$2 + 4 - 6$	0
	✓



d) $7x + 2y = 6$ and $2x - 5y = -15$

$$\frac{2y}{2} = \frac{-7x+6}{2} \quad \frac{-5y}{-5} = \frac{-2x-15}{-5}$$

$$y = -\frac{7}{2}x + 3$$

$$\frac{-5y}{-5} = \frac{-2x-15}{-5}$$

$$y = \frac{2}{5}x + 3$$

Check: $(0, 3)$

LS	RS
$7x + 2y$	6
$7(0) + 2(3)$	
$0 + 6$	
6	✓

LS	RS
$2x - 5y$	-15
$2(0) - 5(3)$	
$0 - 15$	
-15	✓

e) $-4x + y = 5$ and $3x + 2y = -12$

$$y = 4x + 5$$

$$\frac{2y}{2} = \frac{-3x-12}{2}$$

$$y = -\frac{3}{2}x - 6$$

Check: $(-2, -3)$

LS	RS
$-4x + y$	5
$-4(-2) + (-3)$	
$8 - 3$	
5	✓

LS	RS
$3x + 2y$	-12
$3(-2) + 2(-3)$	
$-6 - 6$	
-12	✓

f) $2x + y = 1$ and $-4x - y = -1$

$$y = -2x + 1$$

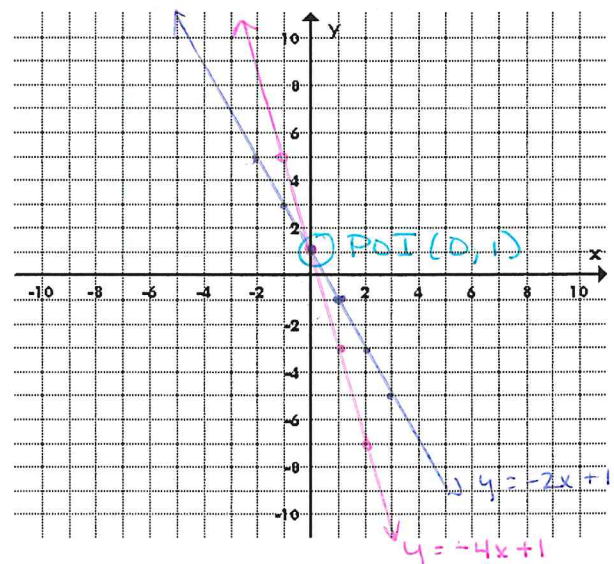
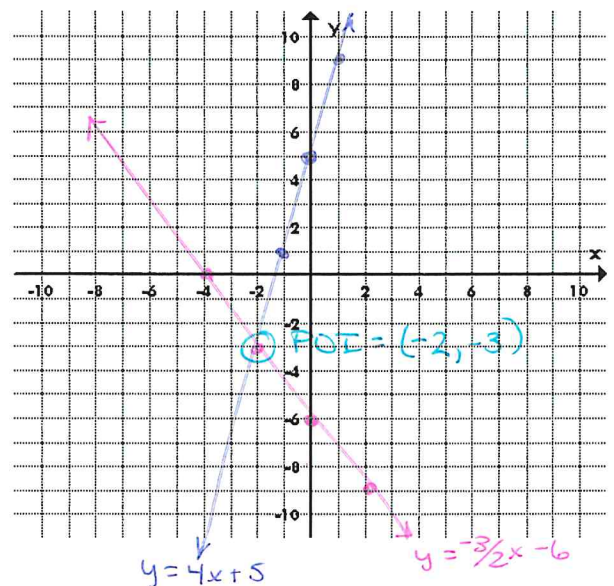
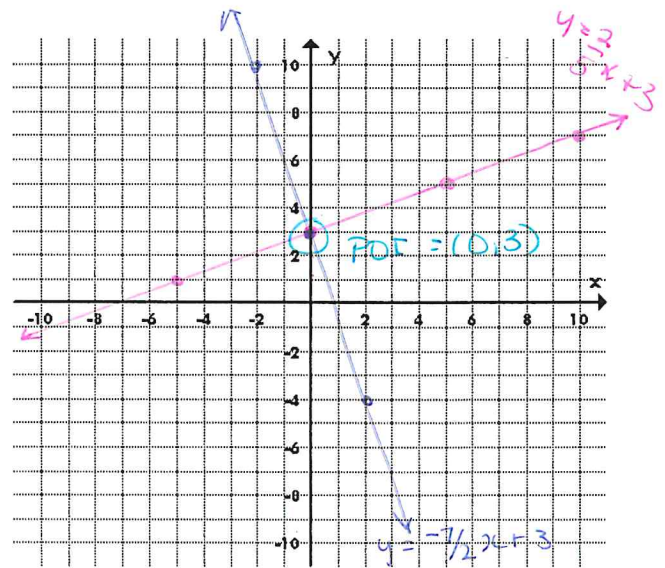
$$\frac{-y}{-1} = \frac{4x-1}{-1}$$

$$y = -4x + 1$$

Check: $(0, 1)$

LS	RS
$2x + y$	1
$2(0) + (1)$	
$0 + 1$	
1	✓

LS	RS
$-4x - y$	-1
$-4(0) - (1)$	
$0 - 1$	
-1	✓



Answers: a) (2, 6)

b) (1, 6)

c) (-3, 2)

d) (0, 3)

e) (-2, -3)

f) (0, 1)

APPLICATION QUESTIONS

Make sure to finish the question with an answer statement

1. In Canada's Arctic, a coordinate system is one way of locating position. Two surveying crews trek along the following paths:

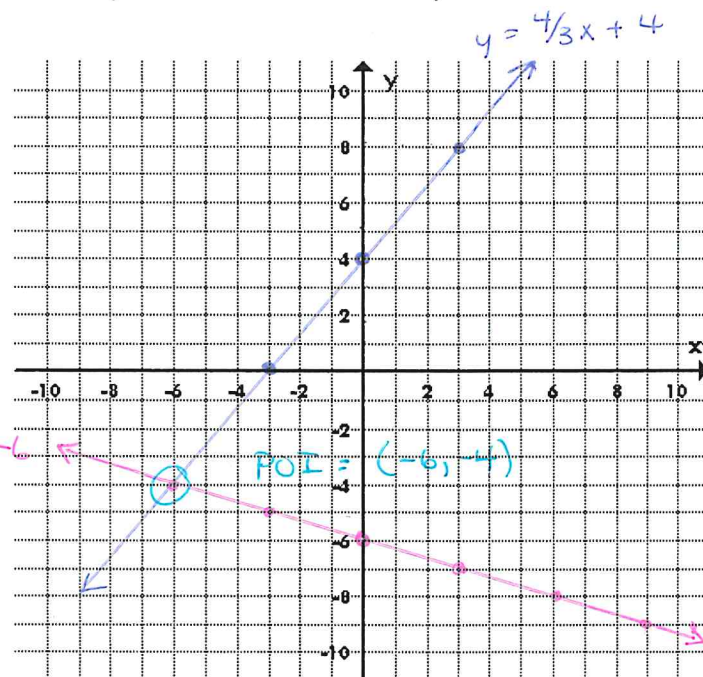
A: Survey crew Hollander: $y = \frac{4}{3}x + 4$

At which point might the two crews meet?

$$\begin{array}{r} -6y = \frac{2x+36}{-6} \\ \hline y = \frac{-1}{3}x - 6 \end{array}$$

∴ The crews will meet at $(-6, -4)$

B: Survey crew Williams: $-2x - 6y - 36 = 0$



2. The position of a wrecked oil tanker is given at the intersection of $y = -2x + 5$ and $3x - 4y - 24 = 0$. Find the coordinates of its position.

$$\begin{array}{r} -4y = -3x + 24 \\ \hline -4 \quad -4 \quad -4 \\ y = \frac{3}{4}x - 6 \end{array}$$

∴ The oil tanker is at $(4, -3)$

