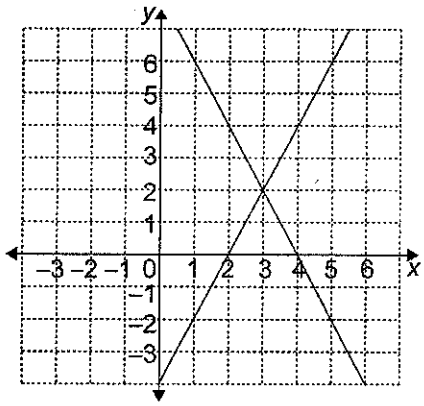
6.7 Practice: Linear Systems

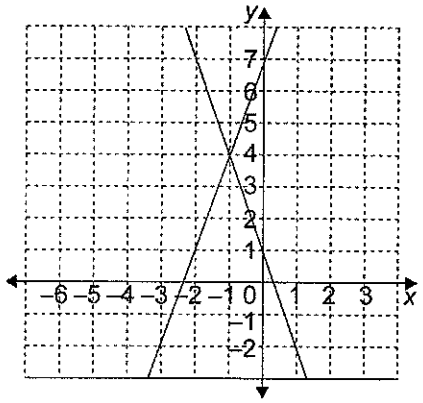
1. What are the coordinates of the point of intersection of each linear system?

a)



POI is (3,2)

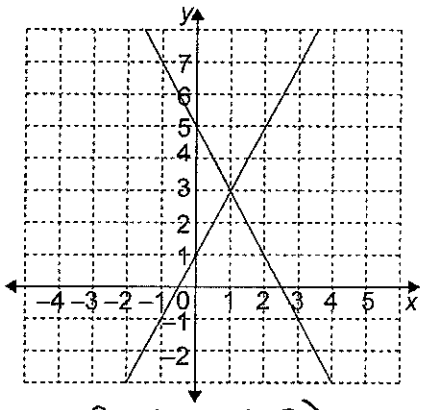
b)



POI is (-1,4)

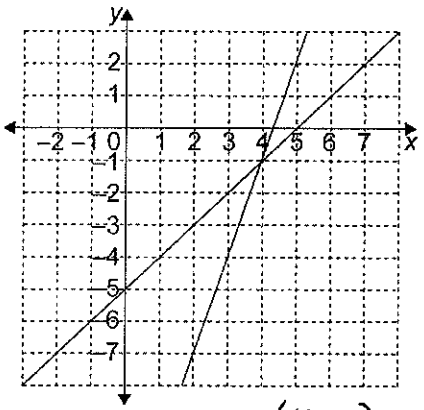
2. What is the solution to each linear system?

a)



POI is (1,3)

b)



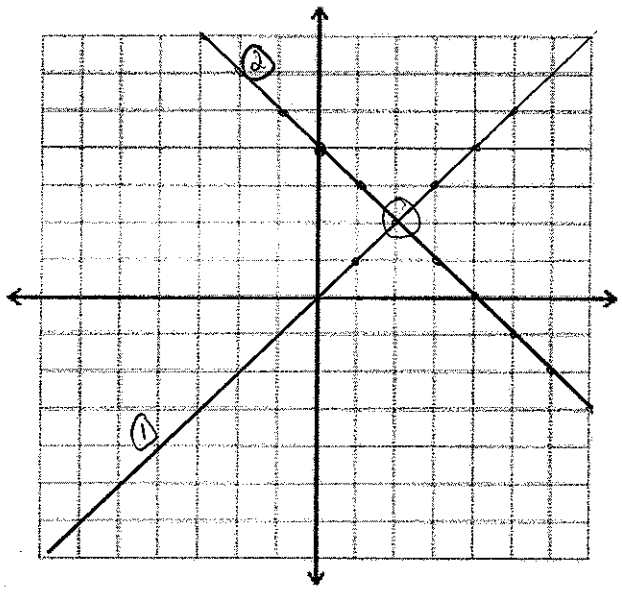
POI is (4,-1)

3. Solve each linear system. Check your solution in both equations.

a) $x + y = 4$ and $y = x$

① $y = -x + 4$

② $y = x$



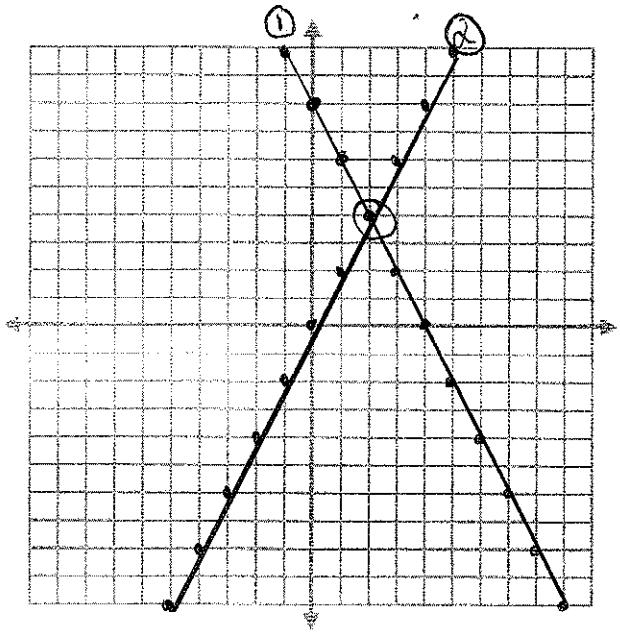
POI is (2,2)

b) $2x + y = 8$ and $y = 2x$

① $y = -2x + 8$

② $y = 2x$

POI is $(2, 4)$

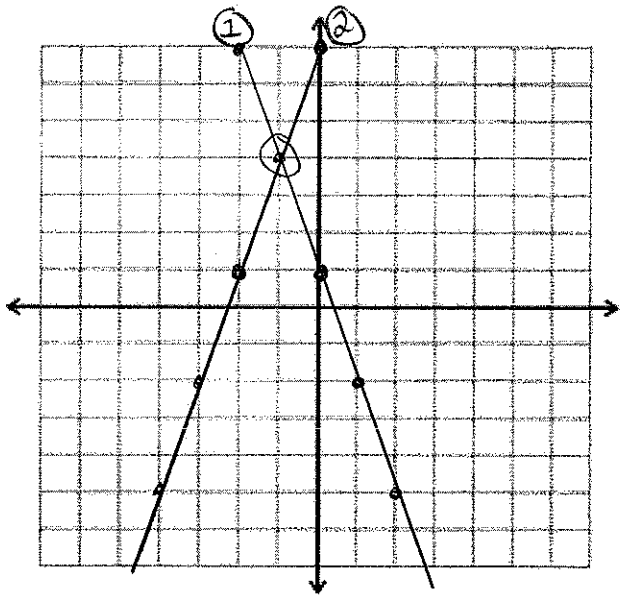


c) $3x + y = 1$ and $y = 3x + 7$

① $y = -3x + 1$

② $y = 3x + 7$

POI is $(-1, 4)$

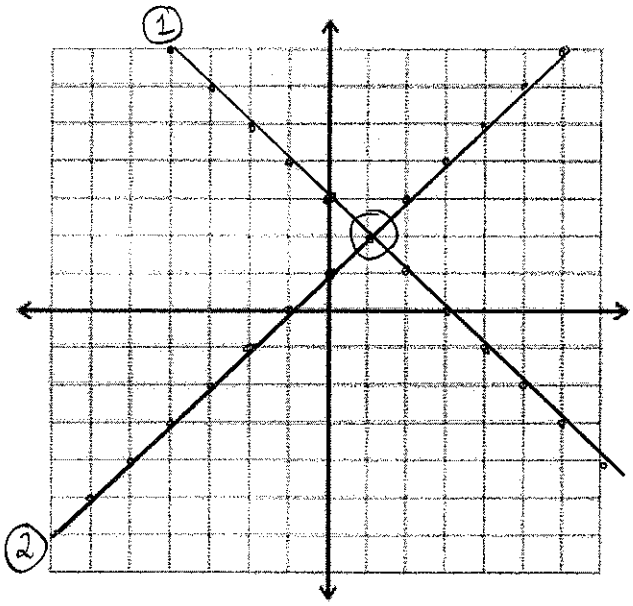


d) $x + y = 3$ and $x - y = -1$

① $y = -x + 3$

② $y = x + 1$

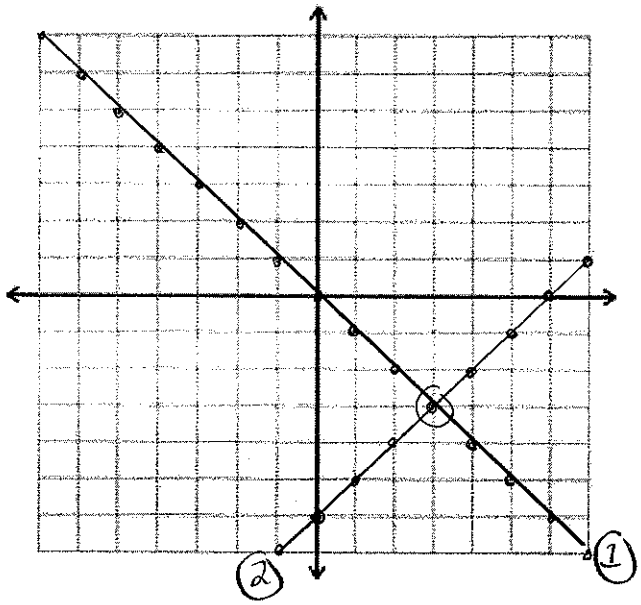
POI is $(1, 2)$



e) y = -x and y = x – 6

① $y = -x$

② $y = x - 6$

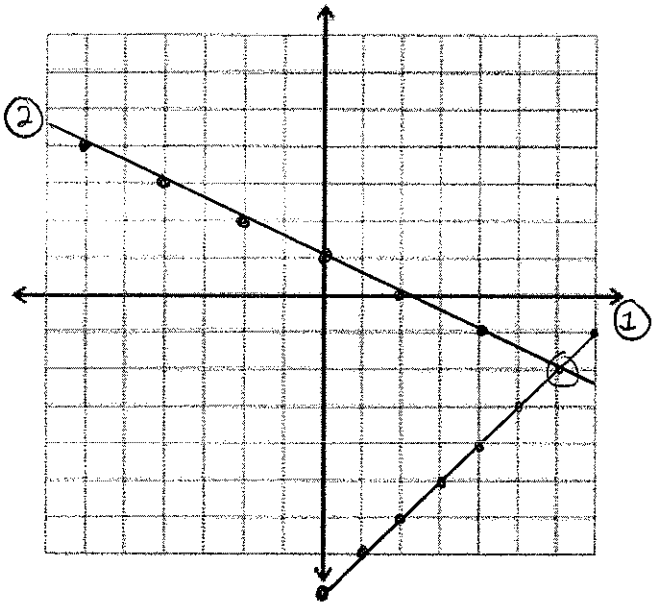


POI is (3, -3)

f) x-y = 8 and x+2y = 2

① $y = x - 8$

② $y = -\frac{1}{2}x + 1$

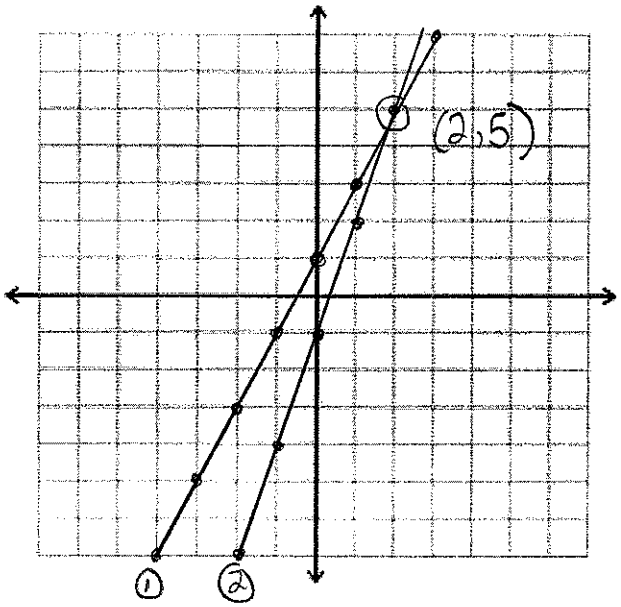


POI is (6, -2)

4. Which is the point of intersection for the linear system $y = 2x + 1$ and $y = 3x - 1$?

A (2, 2)
B (2, 5)
C (5, 2)
D (5, 5)

① ②



Equation 1:

LS: = 5

RS = 2(2)+1 = 5

LS = RS

Equation 2:

LS: = 5

RS: = 3(2)-1 = 6-1 = 5

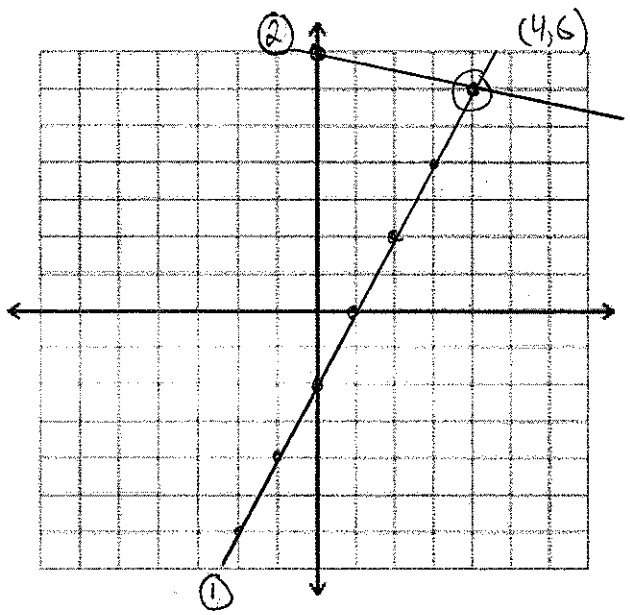
LS = RS

(2,5) is the solution to the linear system.

5. Which is the solution to the linear system $y = 2x - 2$ and $y = -\frac{1}{4}x + 7$?

(2) (2)

A (4, 1)
B (4, –6)
C (4, 6)
D (4, –1)



Equation 1:

LS = 6

RS = 2(4) - 2 = 6

LS = RS

Equation 2:

LS = 6

RS = $(-\frac{1}{4})(4) + 7$ = -1 + 7 = 6

LS = RS

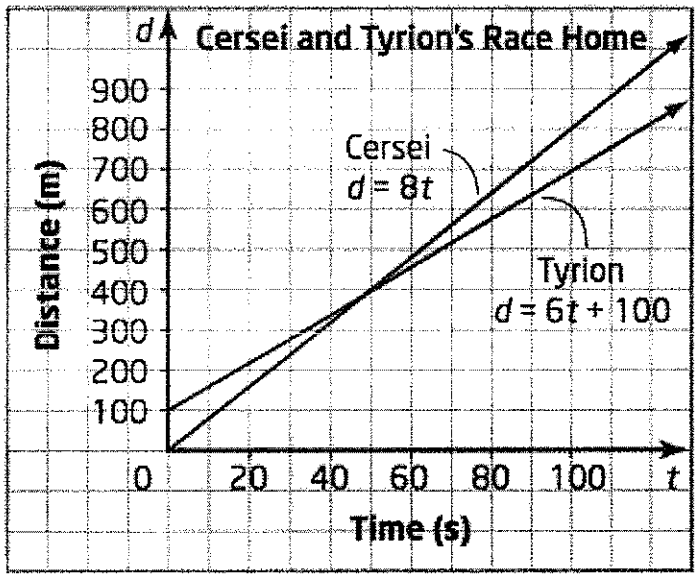
6. Cersei and her brother Tyrion decide to race home. Cersei is a faster runner than Tyrion, so she gives him a head start. Their distance- time graphs are shown.

a) How much of a head start did Tyrion get?

100m

b) How fast does Cersei run?

8m/s



c) How fast does Tyrion run?

6 m/s

d) For what length of race will each runner win? For what length of race will they tie?

Tyrion wins if < 400m

Cersei wins if > 400m

Tie if = 400m

e) Explain the significance of the solution of this linear system.

(50, 400). This shows that they will both be at the 400m mark after 50 seconds.

Answers

1. **a)** (3, 2) **b)** (−1, 4)
2. **a)** (1, 3) **b)** (4, −1)
3. **a)** (2, 2) **b)** (2, 4)
   c) (−1, 4) **d)** (1, 2)
   e) (3,-3) **f)** (6,-2)
4. B
5. C
6. a) 100 m b) 8m/s c) 6 m/s d) Cersei will win if the race longer than 400 m while Tyrion will win if the race is shorter than 400 m. If the race is 400 m, then they will tie e) The solution is (50,400). Cersei will catch Tyrion after 50 seconds at a distance of 400 m.