Answer Key

Name: _____
Date: _____

Systems of Equations
Practice Test

1. What is the ***point of intersection*** between the lines defined by the linear equations below?

Eq. 1) $y = -\frac{1}{2}x - 14.5$

Eq. 2) $y = \frac{4}{5}x + 18$

$y = -.5x - 14.5$

$y = 0.8x + 18$

① Solve for x

$-.5x - 14.5 = 0.8x + 18$

$\frac{-1.3x}{-1.3} = 32.5$

$x = -25$

② Plug in
Solve for y

$y = -.5(-25) - 14.5$

$y = -2$

(5 pts)

Answer (-25 , -2)

2. What is the ***point of intersection*** between the lines defined by the equations below?

Eq. 1) $3y = -2x - 18$

$\frac{3y}{3} = \frac{-2x}{3} - \frac{18}{3}$

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

Eq. 2) $4x + 3y = 72$

$\frac{4x}{3} + \frac{3y}{3} = \frac{72}{3}$

$y = -\frac{4}{3}x + 24$

① Solve for x

$-\frac{2}{3}x - 6 = -\frac{4}{3} + 24$

$-\frac{2}{3}x + \frac{4}{3}x = 24 + 6$

$\frac{2}{3}x = 30$

$x = 45$

② Solve for y

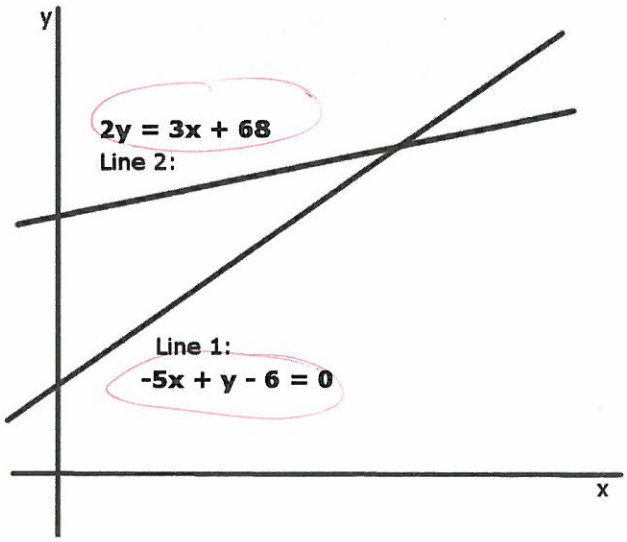
$y = -\frac{2}{3}(45) - 6$

$y = -36$

(5 pts)

Answer (45 , -36)

3. What is the ***point of intersection*** between lines 1 and 2 shown below?



① Solve for x

$\frac{2y}{2} = \frac{3x}{2} + \frac{68}{2}$

$y = 3/2x + 34$

$-5x + y - 6 = 0$

$y = 5x + 6$

$3/2x + 34 = 5x + 6$

$1.5x + 34 = 5x + 6$

$-3.5x = 6 - 34$

$-3.5x = -28$

$x = 8$

② solve for y

$y = 3/2(8) + 34$

$y = 46$

(5 pts)

Answer (8 , 46)

4. Which of the following statements about the system of equations below is true?

/ 5 pts

Eq. 1) **4y = 6x + 24**

Eq. 2) **2y – 3x – 12 = 0**

$\frac{4y}{4} = \frac{6x}{4} + \frac{24}{4}$

$y = 1.5x + 6$

the same equation

$\frac{2y}{2} - \frac{3x}{2} - \frac{12}{2} = 0$

$y = 3/2x + 6$

$1.5x + 6 = 3/2x + 6$

$1.5x - \cancel{1.5x} = 6 - \cancel{6}$

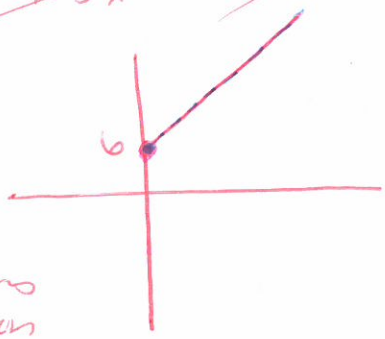
A) The system has one unique solution

B) The system has two unique solutions

C) The system has no solutions

D) The system has an infinite number of solutions

$\mathbb{R}$ all real numbers



Answer: D

The lines are one on top of the other so there are "points" of intersection along the whole equation

5. What is the solution to the system of equations below?

4y = 9x + 36.

$\frac{4y}{4} = \frac{9x}{4} + \frac{36}{4}$

$y = 9/4x + 9$

4y – 10x + 120 = 0

$\frac{4y}{4} - \frac{10x}{4} + \frac{120}{4} = 0$

$y = 5/2x - 30$

/ 5 pts

(1) $9/4x + 9 = 5/2x - 30$

$9/4x - 5/2^{\times 2}x = -30 - 9$

$9/4x - 10/4x = -39$

$-1/4x = -39$ $\quad x = 156$

(2) $y = 9/4(156) + 9$

$y = 360$

Answer: The solution to the system of equations is: (156 , 360)

6. Word problem

→ two different equations

Mr. Stewart has been invited to join 2 different golf clubs next summer.

He can join at '**Angry Birdies**' for a one time fee of 750$, plus an extra 30$ every time he visits.

He might also join at '**Puff Caddie's**, where they charge 25$ per round with a one time fee of 825$.

a) At what number of visits will the two courses cost the same amount to play?

b) How much will it cost to play at that point?

let x = # of visits
let y = total cost.

Angry Birdies → $y = 30x + 750$

Puff Caddie's → $y = 25x + 825$

a) Solve for x

$30x + 750 = 25x + 825$

$30x - 25x = 825 - 750$

$5x = 75$

$x = 15$

The two courses cost the same at 15 visits

b) Solve for y

$y = 30(15) + 825$

$y = 1275$

it will cost 1275 $

Bonus

(A) which course is best if you play between 1 to 14 rounds?

Answer: $y = 30x + 750$

(B) which course is best if you play 16 rounds and more?

Answer $y = 25x + 825$

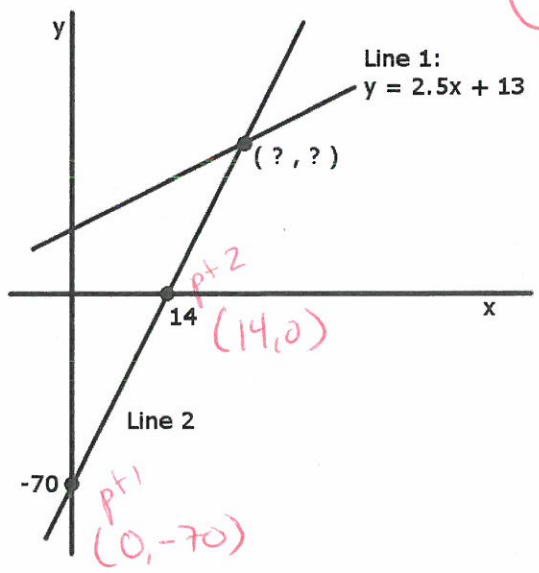
*

Answer:

a) At 15 **rounds, the cost to play at either course is the same.**

b) At that point, it will cost 1275 **to play at either course.**

7. Find the point of intersection between the two lines below. / *10 pts*



1 line 1 → $\boxed{y = 2.5x + 13}$

line 2 → $\frac{y_2 - y_1}{x_2 - x_1} = \frac{(0 - -70)}{14 - 0}$

$= 5$

$\boxed{y = 5x - 70}$

2 Solve for x

$5x - 70 = 2.5x + 13$

$5x - 2.5x = 13 + 70$

$2.5x = 83$

$x = 33.2$

3 solve for y

$y = 5x - 70$

$y = 5(33.2) - 70$

$y = 166 - 70$

$y = 96$

Answer (33.2 **,** 96 **)**