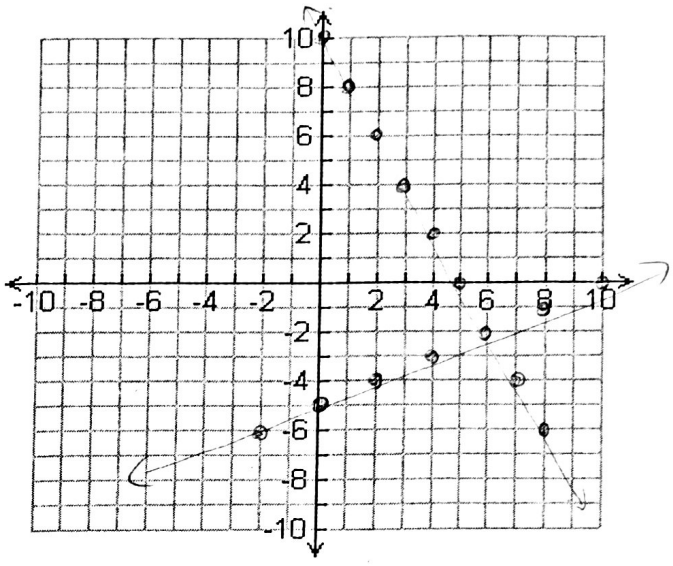
Exam Tune-up #3: Linear Systems | MPM2D

1) Solve the following linear system by graphing

$y = \frac{1}{2}x - 5$ ①
$2x + y - 10 = 0$ ②

↳ $y = -2x + 10$

POI = (6, -2)



2) How many solutions would the following linear system have? One solution, no solutions, or infinitely many solutions? Explain.

$y = \frac{1}{4}x - 3$ ①
$y = \frac{1}{4}x - 4$ ②

They are parallel, with different y-intercepts. This system has NO solutions.

3) Solve the following linear systems using **elimination:**

a) ADD

$4x - y = 5$ ①
$7x + y = 17$ ②

① + ② $11x = 22$

$x = 2$

sub in ① $4(2) - y = 5$

$8 - y = 5$

$y = 3$

POI: (2, 3).

b) SUBTRACT

$2x + 3y = 8$ ① × 3 → $6x + 9y = 24$
$3x + 4y = 10$ ② × 2 → $6x + 8y = 20$

① − ② : $y = 4$

sub in ①: $2x + 3(4) = 8$

$2x + 12 = 8$

$2x = -4$

$x = -2$

POI: (-2, 4).

4) Solve the following linear systems using **substitution:**

a)

$x = 3y - 5$ ①
$2x - 5y = -6$ ②

sub ① in ②

$2(3y-5)-5y=-6$

$6y-10-5y=-6$

$y-10=-6$

$y=4$

sub in ①

$x=3(4)-5$

$x=7$

POI: $(7,4)$

b)

$x + 3y = -1$ ① → $x=-1-3y$
$5x + y = 37$ ②

sub ① in ②

$5(-1-3y)+y=37$

$-5-15y+y=37$

$-5-14y=37$

$-14y=42$

$y=-3$

Sub in ①

$x=-1-3(-3)$

$x=8$

POI: $(8,-3)$

5) Two axe-throwing clubs offer the following yearly membership options:

Club A: \$200 membership fee, and \$12.50 for each time you visit $C = 200 + 12.5x$ ①
Club B: \$50 membership fee, and \$25.00 for each time you visit $C = 50 + 25x$ ②

How many times would you have to visit in a year for each club membership to cost the same?

Set ① = ②

$200 + 12.5x = 50 + 25x$

$200 - 12.5x = 50$

$-12.5x = -150$

$x = 12$

If you go 12 times, the two clubs cost the same.