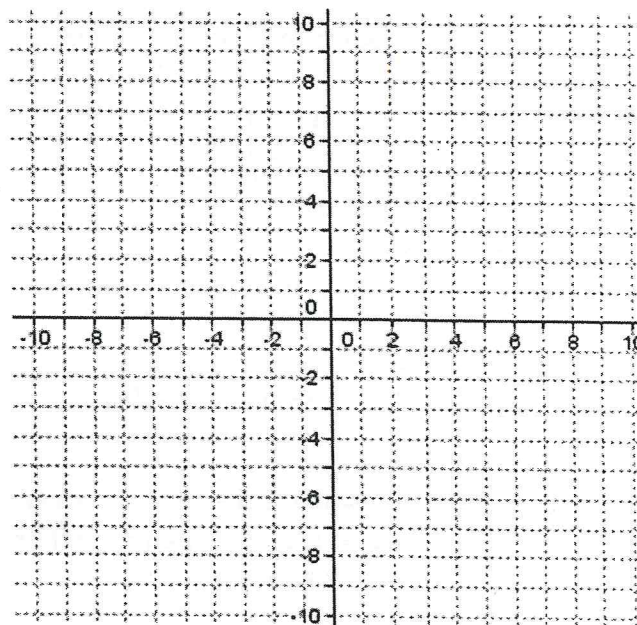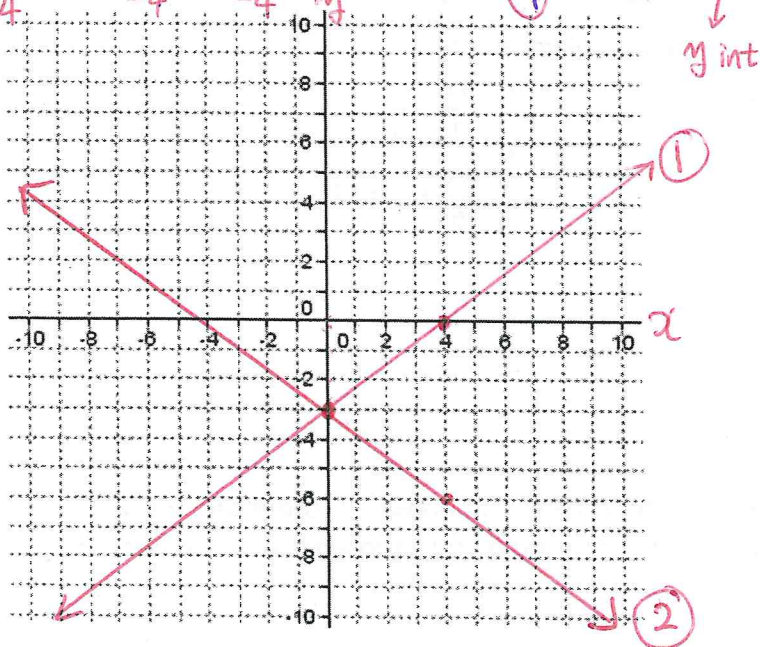1. When solving a system of equations you are finding ___intersection point (POI)___

2. Three methods used to solve a system of equations are:

   $y = mx + b$

   1. ___Elimination___

   2. ___Substitution___

   3. ___Graphing___

   ① same slopes (or "m") → parallel → no solution

   ② same slope (or "m") and same "b" → infinite # of solutions

   ③ different "m" → one solution

   ④ two slopes are negative reciprocal → perpendicular ↳ one solution

3. List the three different ways lines can intersect and describe how you can tell, **without** solving, which situation exists.

   ② $8y = -24 - 6x$ → $\frac{8y}{8} = \frac{-24}{8} - \frac{6x}{8}$ → $y = -\frac{3}{4}x - 3$

   m | b ↓ y in

4. Solve the following systems by graphing:

   a) $3x - 4y = 12$ — ①

   $6x + 8y = -24$ — ②

   *Rearrange ①

   ① $\frac{-4y}{-4} = \frac{-3x}{-4} + \frac{12}{-4}$ M → $y = \frac{3}{4}x - 3 = b$ a) ∴ POI = (0, -3)

   y int

   b) $2x + 5y = 10$

   $3x + y = 6$

   c) Explain the problem with using the graphing method to solve a system of equations.

5. Solve the following systems using the method of substitution.

   a) $2x + 3y - 9 = 0$

   $x - y - 2 = 0$

   b) $x + 5y = 11$

   $4x - y = 2$

   c) $x - 7 = y$

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

6. Solve each of the following systems using the elimination method.

   a) $x + y - 5 = 0$

   $x - y - 3 = 0$

   b) $x - 2y - 10 = 0$

   $3x + 5y + 3 = 0$

7. In question 6b), which variable did you eliminate? Solve the system again, this time eliminate the **OTHER** variable. How does your method have to change? Is one way of doing this question easier than the other? Why?

8. IN YOUR OWN WORDS, explain:
   - how the elimination method works
   - when to add and when to subtract
   - when to multiply equations and how to choose which numbers to multiply by

9. Solve each of the following system of equations using the elimination method. Some of these systems have twists to them. Working through them will help you to develop an even deeper understanding of the elimination method.

a) $4x - 3y - 17 = 0$
   $3x + 2y = 0$

b) $8x = 24 - 3y$
   $10 - 4x = y$

c) $0.4x + 0.3y = 5$
   $10x + 5y = 100$

d) $\dfrac{x}{4} + \dfrac{y}{5} = 5$
   $x + y = 22$

10. Solve the following systems using the method of your choice.

a) $2(x - 4) + y = 6$
   $3x - 2(y - 3) = 13$

b) $\dfrac{4x}{3} - \dfrac{y}{4} = 6$
   $\dfrac{5x}{6} + y = 13$

c) $\dfrac{x - 5}{3} + \dfrac{y + 1}{2} = 1$
   $\dfrac{x - 1}{5} + \dfrac{y + 2}{3} = 2$

11. Compare the methods of graphing, substitution and elimination. Is there one method that is better than the others? In what situation would you choose to use one method over another?

ANSWERS			
4a) $(0, -3)$	b) $(\frac{20}{13}, \frac{18}{13})$		
5a) $(3, 1)$	b) $(1, 2)$	c) $(8, 1)$	
6a) $(4, 1)$	b) $(4, -3)$		
7. $(4, -3)$			
9a) $(2, -3)$	b) $(\frac{3}{2}, 4)$	c) $(5, 10)$	d) $(12, 10)$
10a) $(5, 4)$	b) $(6, 8)$	c) $(-4, 7)$	

June 10   MPM2D

#6 b) $x - 2y - 10 = 0$ — ①

$3x + 5y + 3 = 0$ — ②

①×3 $-\begin{vmatrix} 3x - 6y - 30 = 0 & — ①×3 \end{vmatrix}$

$0 + 11y + 33 = 0$

$11y = -33$

$y = \dfrac{-33}{11} = -3$

Sub $y = -3 \rightarrow$ ①

$x - 2(-3) - 10 = 0$ —①

$x + 6 - 10 = 0$

$\therefore x = 4$

$\therefore x = 4$ and $y = -3$

#10b) $\dfrac{4x}{3} - \dfrac{y}{4} = 6$ — ①   (Substitution)

$\boxed{\dfrac{5x}{6}} + y = 13$ — ②

② $y = 13 - \dfrac{5x}{6} \longrightarrow$ sub into ① $\dfrac{4x}{3} - \dfrac{\left(13 - \frac{5x}{6}\right)}{4} = 6$

① $\dfrac{4x}{3} - \dfrac{\frac{(13 \times 6) - 5x}{6}}{4} = 6$

$\dfrac{4x}{3} - \dfrac{\frac{78 - 5x}{6}}{4} = 6$

$\dfrac{4x}{3} - \dfrac{78 - 5x}{6 \times 4} = 6$

$\dfrac{32x - (78 - 5x)}{24} = 6$

$\dfrac{(32x + 5x - 78)}{24} = 6$

$\dfrac{37x - 78}{24} = 6$

$37x - 78 = 6 \times 24$

$37x = 144 + 78$

$37x = 222$

$x = \dfrac{222}{37}$

$\therefore x = 6$

* Sub $x = 6$ into ②

$\dfrac{30}{6} + y = 13 \rightarrow \therefore y = 8$

10 a) $2x - 8 + y = 6$ — ①

$3x - 2y + 6 = 13$ — ②

* Rearrange ① $2x + y = 14$

"   ② $3x - 2y = 7$

* ①×2 $+ \overline{| 4x + 2y = 28}$

$7x = 35$

∴ $x = 5$ → sub into ①

$2(5) - 8 + y = 6$

$10 - 8 + y = 6$

$y = 6 - 2$

∴ $y = 4$