

**Test #2 NEXT WEDNESDAY (9/19)**

emphasis on chapters 3 & 4, but will include some review problems! similar to old test #2, but will also include systems of linear equations (4.1,4.2)

**Rather than taking the test in the 40-minute class period, we will take the test during the AHSGE morning break at 8:00 am.** We will meet for class during the regularly scheduled time that day.

3.5

45.  $P_1(-2, 5); P_2(-2, -5)$

$$x = -2$$

3.6

17.  $(-3, 2), (4, -1)$  &  $(1, 3), (-2, -4)$

$$\frac{2 - (-1)}{-3 - 4} = -\frac{3}{7}$$

$$\frac{3 - (-4)}{1 - (-2)} = \frac{7}{3}$$

yes, perpendicular

$y = 3$  ; line perpendicular to  
 horizontal ; this passing through  $(1, 5)$

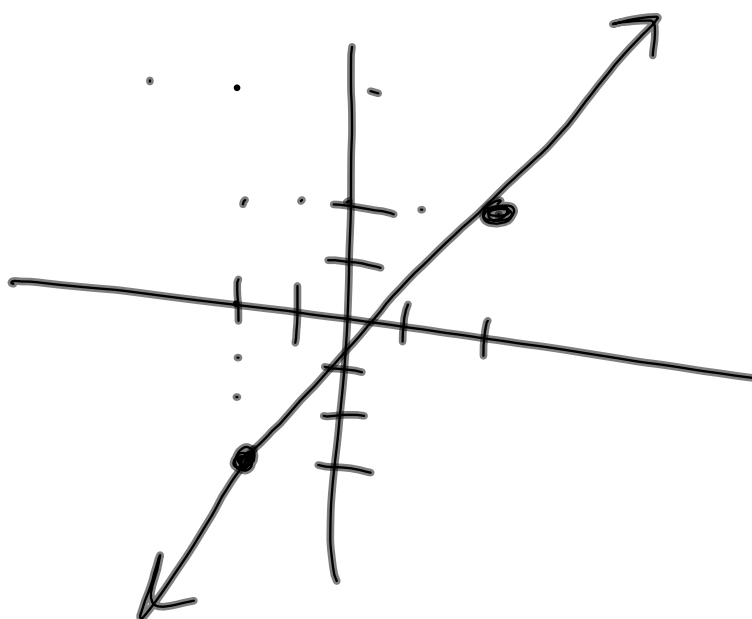
$$x = 1$$

9.4

$$39. (-2, -3); m = \frac{5}{4}$$

$$y - y_1 = m(x - x_1)$$

$$y - (-3) = \frac{5}{4}(x - (-2))$$



$\frac{+5}{+4}$  up  
right

$\frac{-5}{-4}$  down  
left

## 4.2 Solving Systems of Linear Equations By the Addition Method. (Elimination Method)

$$14. \begin{cases} 3x + 6y = 7 & (1) \\ 2x + 4y = 5 & (2) \end{cases}$$

multiply (1) by -2  
(2) by 3

$$\begin{cases} -6x - 12y = -14 \\ 6x + 12y = 15 \end{cases}$$

$0 = 1$   
inconsistent system  
 $\Rightarrow$  no solution

Rules: we can

1. multiply an equation by a non-zero constant
2. interchange any 2 equations
3. add a nonzero multiple of any equation to another

$$16. \begin{cases} 3x + 4y = 25 & (1) \\ 2x + y = 10 & (2) \end{cases}$$

multiply (2) by  $-4$

$$\begin{cases} 3x + 4y = 25 \\ -8x - 4y = -40 \end{cases}$$

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$$-5x = -15$$

$$x = 3$$

$$(3, 4)$$

$$2(3) + y = 10$$

$$y = 10 - 6$$

$$y = 4$$

$$26. \begin{cases} 3x+3y=y+1 \\ x+3y=9-x \end{cases} \Rightarrow \begin{cases} 3x+2y=1 & (1) \\ 2x+3y=9 & (2) \end{cases}$$

mult. (1) by 3 & (2) by -2

$$\begin{cases} 9x+6y=3 \\ -4x-6y=-18 \end{cases}$$

$$\hline 5x = -15$$

$$x = -3$$

$$\boxed{(-3, 5)}$$

$$3(-3)+2y=1$$

$$-9+2y=1$$

$$2y=10$$

$$y=5$$

Solve using a Matrix!

$$26. \begin{cases} 3x+2y=1 \\ 2x+3y=9 \end{cases} \Rightarrow \left[ \begin{array}{cc|c} 3 & 2 & 1 \\ 2 & 3 & 9 \end{array} \right]$$

augmented  
matrix

Goal is to rewrite in the form

$$\left[ \begin{array}{cc|c} 1 & 0 & a \\ 0 & 1 & b \end{array} \right]$$

solution is  
(a,b)

Solution:

$$\left[ \begin{array}{cc|c} 3 & 2 & 1 \\ 2 & 3 & 9 \end{array} \right] \xrightarrow{(1)-(2)} \left[ \begin{array}{cc|c} 1 & -1 & -8 \\ 2 & 3 & 9 \end{array} \right]$$

$$\xrightarrow{(2)-2 \cdot (1)} \left[ \begin{array}{cc|c} 1 & -1 & -8 \\ 0 & 5 & 25 \end{array} \right] \xrightarrow{(2) \cdot \frac{1}{5}} \left[ \begin{array}{cc|c} 1 & -1 & -8 \\ 0 & 1 & 5 \end{array} \right]$$

$2-2(1)$     $3-2(-1)$     $9-2(-8)$

$$\xrightarrow{(1)+(2)} \left[ \begin{array}{cc|c} 1 & 0 & -3 \\ 0 & 1 & 5 \end{array} \right] \quad \boxed{(-3, 5)}$$

$$56. \quad 2x - y + z = 6$$

$$3x + 2y + z = 4$$

$$x - 2y + 3z = 12$$

$$\Rightarrow \left[ \begin{array}{ccc|c} 2 & -1 & 1 & 6 \\ 3 & 2 & 1 & 4 \\ 1 & -2 & 3 & 12 \end{array} \right]$$

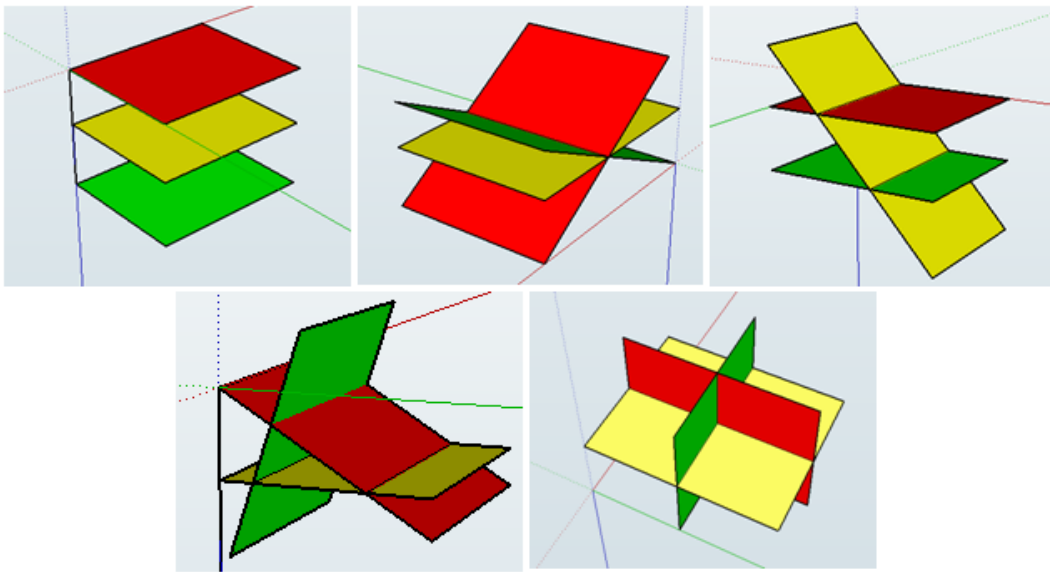
interchange  
(1) & (3)

$$\left[ \begin{array}{ccc|c} 1 & -2 & 3 & 12 \\ 3 & 2 & 1 & 4 \\ 2 & -1 & 1 & 6 \end{array} \right]$$

$$\begin{array}{l} \xrightarrow{(2)-3(1)} \\ \xrightarrow{(3)-2(1)} \end{array} \left[ \begin{array}{ccc|c} 1 & -2 & 3 & 12 \\ 0 & 8 & -8 & -32 \\ 0 & 3 & -5 & -18 \end{array} \right]$$

. . .





Homework:

Read handout on how to solve a linear system of equations using a matrix here: <http://www.asms.net/brewer/precal-matrixoperations.pdf> ("Matrices" link under "Precalculus" on my web site asms.net/brewer)

Watch "Matrices: Reduced Row Echelon Form 2" on Khan Academy: <http://www.khanacademy.org/math/algebra/algebra-matrices/v/matrices--reduced-row-echelon-form-2>

Practice "Systems of equations with elimination" on Khan Academy: [http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/e/systems\\_of\\_equations\\_with\\_elimination](http://www.khanacademy.org/math/algebra/systems-of-eq-and-ineq/e/systems_of_equations_with_elimination)

Work textbook problems 4.2#49-63 odd using matrices.

