



Fall 2021 Precalc Lesson 2.2

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Do Now

Dr. O'Brien 2/8/22

Be sure to...Get out your notebook/binder. Read the paragraph below carefully, then answer the questions below. Show all work and check your results!

Use elimination to solve the system to the right.

$$\begin{cases} 5x + 3y = 6 \\ 3x - y = 5 \end{cases}$$

class: precalc goal: HDW use the elimination to solve multivariate systems of equations?



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B24 rules

Welcome to our new room, B24! Please read the information below:

1. When you come in, please find a seat at a desk (if one's available) or one of the six closest desks to the screen. **Do not sit in the back of the classroom.** We'll conduct the do now and mini lesson from here.
2. When I dismiss you for independent work, find a sit at one of the computer workstations.
3. **No food or drink by the computers.**
4. At the end of the period, you'll be directed to assemble for the exit ticket/debrief. Log out of your computer, and **quietly** return to a seat near the front.

class: precalc goal: HDW use the elimination to solve multivariate systems of equations?



framing

- **what:** use the elimination to solve multivariate systems of equations
- **why:** Systems of equations are useful in situations where variables must more than two conditions.
- **where to:** representing systems of equations as matrices

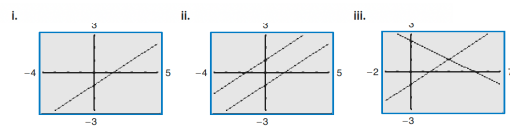
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Warm up

match the system to the appropriate graph.

a. $\begin{cases} 2x - 3y = 3 \\ -4x + 6y = 6 \end{cases}$ b. $\begin{cases} 2x - 3y = 3 \\ x + 2y = 5 \end{cases}$ c. $\begin{cases} 2x - 3y = 3 \\ -4x + 6y = -6 \end{cases}$



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mini-lesson

To solve systems with more than two variables, we want to transform the system into **row-echelon form**:

System of Three Linear Equations in Three Variables

$$\begin{cases} x - 2y + 3z = 9 \\ -x + 3y + z = -2 \\ 2x - 5y + 5z = 17 \end{cases}$$

Equivalent System in Row-Echelon Form

$$\begin{cases} x - 2y + 3z = 9 \\ y + 4z = 7 \\ z = 2 \end{cases}$$

A system is in **row-echelon form** if it has a stair-step pattern and each equation has a leading coefficient of 1.

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mini-lesson

To see why, row-echelon form is useful. Let's solve this system:

Equivalent System in Row-Echelon Form

$$\begin{cases} x - 2y + 3z = 9 \\ y + 4z = 7 \\ z = 2 \end{cases}$$

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mini-lesson

Operations we can perform **row operations** on equations:

1. exchange two rows
2. multiply two rows by some number (not zero)
3. add a multiple of one row to another

Let's use elimination to solve this system:

$$\begin{cases} x - 2y + 3z = 9 \\ -x + 3y + z = -2 \\ 2x - 5y + 5z = 17 \end{cases}$$

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+why are these called row operations? write system of eqs as a matrix. all we care about are the rows of numbers. Show augmented matrix but don't call it that yet.



Independent work

1. Check whether (a-d) are solutions to this system:

$$\begin{cases} 3x - y + z = 1 \\ 2x - 3z = -14 \\ 5y + 2z = 8 \end{cases}$$

(a) (3, 5, -3) (b) (-1, 0, 4)
(c) (0, -1, 3) (d) (1, 0, 4)

2. Use back substitution to solve this system:

$$\begin{cases} 2x - y + 5z = 16 \\ y + 2z = 2 \\ z = 2 \end{cases}$$

3. Perform row operations to transform to row-echelon form:

$$\begin{cases} x - 2y + 3z = 5 \\ -x + 3y - 5z = 4 \\ 2x - 3z = 0 \end{cases}$$

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1. (b).
2. $y = 2 - (2 \cdot 2) = -2$
 $x = 16 + -2 + 10. / 2 = 12$



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wrapping up!

be sure to: read the directions below!



1. Make sure there isn't any litter near your workstation.
2. If you borrowed headphones, sign them back in.
3. **Make sure you are logged out of your computer!**
4. Remain in your seat until the bell rings.

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