



# LESSON 2

## MA 26100-FALL 2023

DR. HOOD

# SUPPLEMENTAL INSTRUCTION

SI Leader	Session 1	Session 2	Session 3	Office hour
Anna Szakats	Sun @ 4:30 PM Academic Success Center	Tue @ 4:30 PM <del>FRNY 1043</del> UNIV 001	Thu @ 4:30 PM <del>FRNY 1043</del> UNIV 001	Thu @ 12:00 PM WILY C215 + Zoom
Jorge Mendoza	Sun @ 6:30 PM Academic Success Center	Mon @ 6:30 PM WALC 3122	Wed @ 6:30 PM WALC 3122	Wed @ 10:30 AM WILY C215 + Zoom

# LESSON 2 - WARM UP

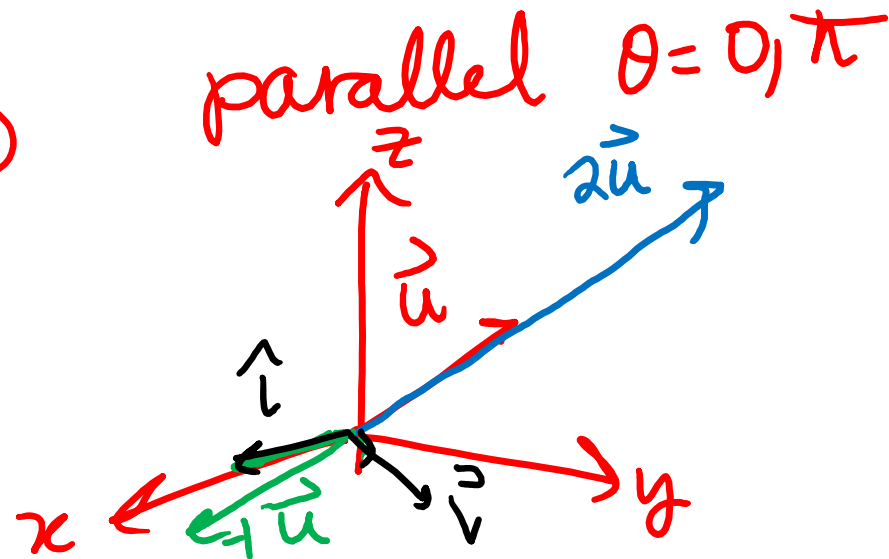
What does it mean for the vectors  $\vec{u}$  and  $\vec{v}$  to be parallel?

*orthogonal*  
 $\vec{u} \cdot \vec{v} = |\vec{u}| |\vec{v}| \cos \theta \rightarrow \theta = \frac{\pi}{2}, -\frac{\pi}{2}$

a)  $\vec{u} \cdot \vec{v} = 0$

b)  $\vec{u} = k \vec{v}$ , for some scalar  $k$

~~c)  $\vec{u} \times \hat{i} = \vec{v}$~~   
 $2\vec{u} \parallel \vec{u}$   
 $-1\vec{u} \parallel \vec{u}$



# MYLAB MATH

- Need an **access code** for the Pearson MyLab Math platform to complete your homework online in MyLab Math.
  - [Video Instructions: How to Register for MLM](#)
- 24-month access code – Pearson had a glitch
- **HW1 is now due on Monday Aug 28 at 11:59pm**

# DATA SCIENCE LABS

These are 1-credit laboratories that explore applications of your math classes to data science through Arduino/Python projects.

As a Calc 3 student, you are eligible to take either of these two labs:

- **MA16290: The Data Science Labs on Calculus 2**- Start here if you have no Python experience.
- **MA290: The Data Science Labs on Calculus 3** - Requires Python experience.  
Possibility to upgrade MA261 to an honors course.

Both count towards the Applications in Data Science Certificate.

More info at [https://engineering.purdue.edu/~mboutin/Data\\_Science\\_labs.html](https://engineering.purdue.edu/~mboutin/Data_Science_labs.html)

# OFFICE HOURS

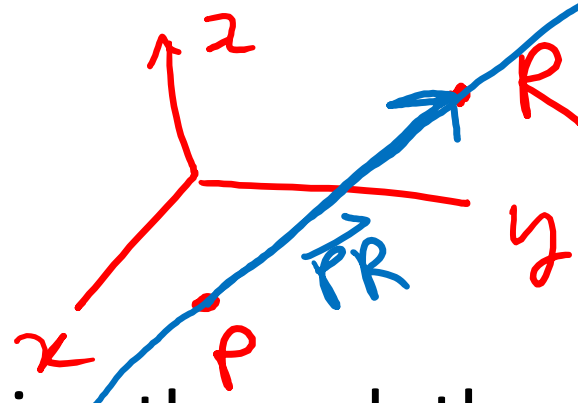
- **Dr. Hood's Office Hours:**

- Mon, Wed, Fri at 2:00-3:00pm in MATH 844

- Extra office hour to review vectors:

- Thursday Aug 24 at 11am – 12pm in MATH 844

# POLL 1



Find the equation of the line passing through the points  $(1, 4, -2)$  and  $(-3, 5, 0)$

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$$a) \frac{x-1}{-3} = \frac{y-1}{5} = \frac{z+2}{1}$$

$$b) \frac{x+3}{1} = \frac{y-5}{1} = \frac{z+0}{-2}$$

$$c) \frac{x-1}{-4} = \frac{y-4}{1} = \frac{z+2}{2}$$

Need a vector parallel to line

$$\vec{v} = \vec{PR} = \langle -3-1, 5-4, 0-(-2) \rangle \\ = \langle -4, 1, 2 \rangle$$

$$\vec{r}_0 = \langle 1, 4, -2 \rangle$$

# POLL 2

Find the relationship between the lines:

$$L_1 = t\langle 1, 0, 0 \rangle$$

$$L_2 = \langle 0, 0, 3 \rangle + t\langle 1, 0, 0 \rangle$$

$$L_3 = \langle 0, 0, 3 \rangle + s\langle 0, 1, 0 \rangle$$

$$\vec{v}_1 = \langle 1, 0, 0 \rangle$$

$$\vec{v}_2 = \langle 1, 0, 0 \rangle$$

$$\vec{v}_3 = \langle 0, 1, 0 \rangle$$

a) Equal

b) Parallel

c) Intersecting

d) Skew  
 $L_1$  and  $L_3$

$$L_1 = L_3$$

$$t\langle 1, 0, 0 \rangle = \langle 0, 0, 3 \rangle + s\langle 0, 1, 0 \rangle$$

$$\langle t, 0, 0 \rangle = \langle 0, s, 3 \rangle$$

$t=0$  no  
 $0=s$  intersection  
 ~~$0=3$~~



# POLL 3

Find the angle between the planes  $2x - 3y + 2z = 3$  and  $6x + 2y - 3z = 1$ .

a)  $\theta = 0$

b)  $\theta = \frac{\pi}{2}$

c)  $\theta = \frac{\pi}{4}$

# MUDDIEST POINTS

What was the muddiest point from today's lecture?

- a) The equation of a line
- b) Definition of skew lines
- c) The equation of a plane
- d) Finding the angle between planes
- e) None – understood everything today