LESSON 3

MA 16200·SPRING 2023
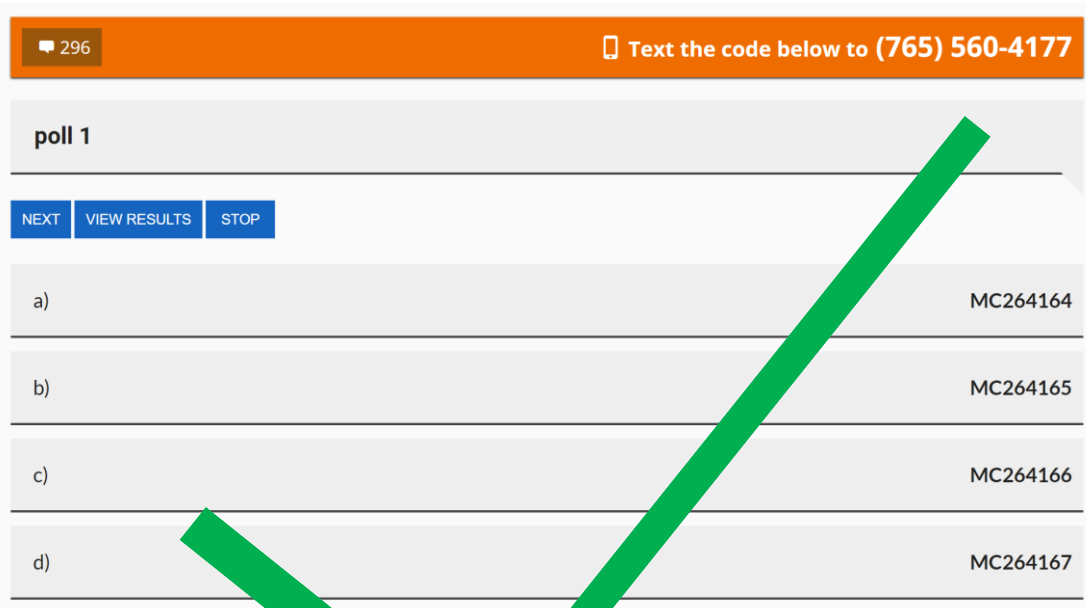
DR. HOOD

USING HOTSEAT

Please submit your answers under Polls

Answers submitted to "Thoughts" (the message board) <u>will not be graded</u>
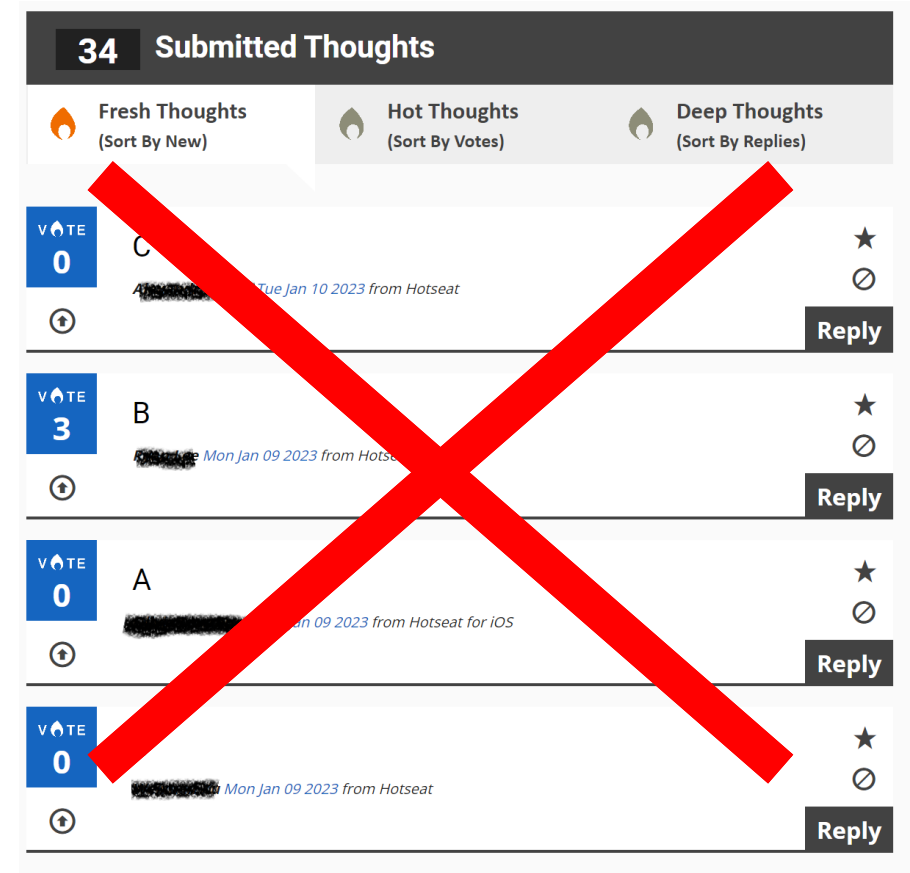
WARM UP

Let $\vec{u} = 5\hat{\imath} + 3\hat{k}$ and $\vec{v} = 7\hat{\jmath} - \hat{k}$. What is $\vec{u} + \vec{v}$ (in position vector form)?

a) $\langle 5, 10, -1 \rangle$

b) $\langle 12, 2, 0 \rangle$

c) $\langle 5, 7, 2 \rangle$

$\vec{u} = \langle 5, 0, 3 \rangle$

$\vec{v} = \langle 0, 7, -1 \rangle$

$\vec{u} + \vec{v} = \langle 5, 7, 2 \rangle$

ANNOUNCEMENTS

- **HW 3**
  - Some questions ask for angles in radians and some ask for angles in degrees
  - Read the instructions carefully

- **MA16290: "Data Science Lab: Calculus."**
  - 1 credit companion course to MA 16200
  - Opportunity to earn honors credit
  - Apply calculus to problems in data science

OFFICE HOURS

- **Dr. Hood's Office Hours:**
  - Mon, Wed at 12:30 – 1:30pm in MATH 844
  - Fri at 1:00 – 2:00pm in MATH 844

- **TA's have office hours in the Math Resource Room (MRR)**
  - WTHR 313
  - Schedule posted online:
    - https://www.math.purdue.edu/academic/courses/helproom

SUPPLEMENTAL INSTRUCTION

SI Leader	Session 1	Session 2	Session 3	Office hour
Alex Hunton	Mon @ 7:30 PM UNIV 001	Tue @ 7:30 PM UNIV 003	Thu @ 4:30 PM UNIV 117	Thu @ 2:00 PM WILY C215
Phoebe Bailey	Sun @ 6:30 PM WILY C215	Mon @ 6:30 PM WTHR 420	Wed @ 6:30 PM WTHR 420	Wed @ 10:30 AM WILY C215

POLL 1

If $\vec{u} = \langle 1,1,1 \rangle$ and $\vec{v} = \langle 2,-1,-1 \rangle$, what is the angle θ between $\vec{u}$ and $\vec{v}$?

a) $\theta = 0$

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

c) $\theta = \pi$

$$1 \cdot 2 + 1 \cdot (-1) + 1 \cdot (-1) = \vec{u} \cdot \vec{v} = |\vec{u}||\vec{v}| \cos\theta$$
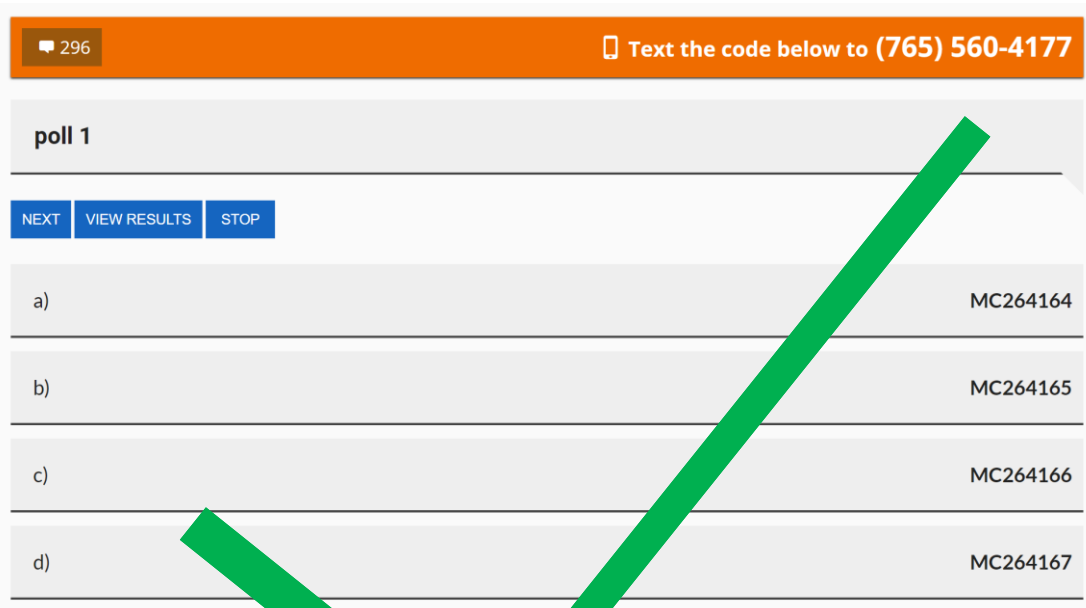
$$2 - 1 - 1 = 0 = |\vec{u}||\vec{v}| \cos\theta$$

$$0 = \cos\theta$$

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

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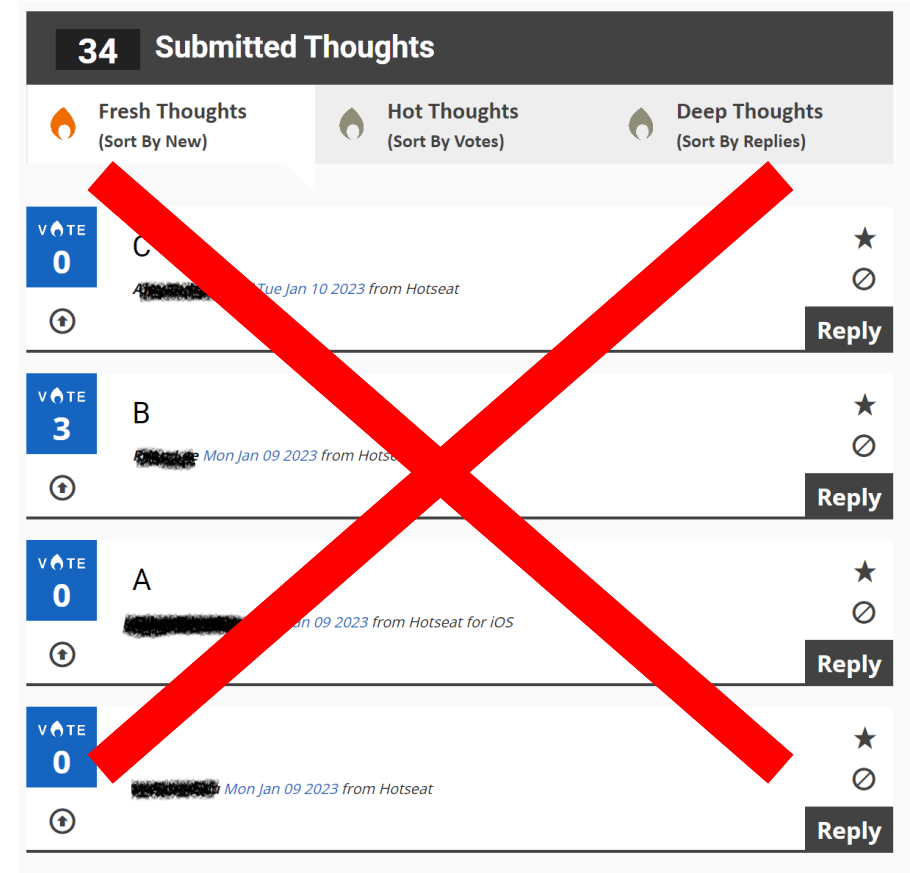Answers submitted to "Thoughts" (the message board) <u>will not be graded</u>

POLL 2 – EXTRA CREDIT

Which of the following vectors is orthogonal to $\hat{\imath} = \langle 1, 0, 0 \rangle$?

a) $\hat{\jmath} = \langle 0, 1, 0 \rangle$

b) $\hat{k} = \langle 0, 0, 1 \rangle$

c) Both $\hat{\jmath}$ and $\hat{k}$

d) Neither $\hat{\jmath}$ nor $\hat{k}$

$$\hat{\imath} \cdot \hat{\jmath} = 1 \cdot 0 + 0 \cdot 1 + 0 \cdot 0 = 0$$

$$\hat{\imath} \cdot \hat{k} = 0$$

POLL 3

If $\vec{u} = \langle 7, -3, 2 \rangle$ and $\vec{v} = \langle 1, 0, 0 \rangle$, what is the orthogonal projection: $\text{proj}_{\vec{v}}(\vec{u})$?

a) 7

b) $\langle 7, 0, 0 \rangle$

c) $\left\langle \dfrac{49}{\sqrt{62}}, \dfrac{-21}{\sqrt{62}}, \dfrac{14}{\sqrt{62}} \right\rangle$