



LESSON 3

MA 26100-FALL 2023

DR. HOOD

Lesson 3:

WARM UP

The point $(2, 0, -3)$ lies on a sphere centered at $(1, 1, 1)$. What is the radius of the sphere?

a) $3\sqrt{2}$

b) 18

c) 6

d) $\sqrt{6}$

$$(x-1)^2 + (y-1)^2 + (z-1)^2 = r^2$$

$$(2-1)^2 + (0-1)^2 + (-3-1)^2 = r^2$$

$$1^2 + (-1)^2 + (-4)^2 = r^2$$

$$18 = r^2$$

$$r = \sqrt{18} = 3\sqrt{2}$$

???

QUIZ STUDY GUIDE

- Quiz Study Guide:

https://www.math.purdue.edu/~kthood/docs/MA261_Fall2023/quiz_study_guide_ma261_f23.pdf

- Past Exam Archive:

<https://www.math.purdue.edu/academic/courses/oldexams.php?course=MA26100>

- Quiz 1:

- Tuesday Aug 29
- In Recitation

#	Lesson:	Sec:	Quiz:	You should be able to:	You should know:	Past Exam Problems:
1	Review of Vectors	13.1 13.2 13.3 13.4	1	<ul style="list-style-type: none"> - Compute vector operations - Find magnitude of a vector - Find a position vector - Find the equation of a sphere, ball, or circle - Find equations of simple planes - Compute dot products - Find angles between vectors - Calculate orthogonal projections - Compute cross products - Find areas of parallelograms and triangles - Find orthogonal vectors 	Vector, scalar, magnitude, zero vector, position vector, unit vector, parallel, sphere, ball, circle, plane, dot product, orthogonal, orthogonal projection, cross product, determinant, coordinate unit vectors (i, j, k)	Few exam questions test these concepts directly. However, you will need these concepts to complete the more difficult questions from the past exams. S18E1#3 S18FE#1 S16E1#1
2	Lines & Planes in Space	13.5	1	<ul style="list-style-type: none"> - Find equations of lines and line segments - Find equations of planes - Determine whether planes are parallel, intersecting, or identical - Find intersections between lines and/or planes 	Parallel, intersecting, skew, orthogonal planes	S19E1#1 S19E1#2 S19FE#1 F19E1#1 F19FE#1 F18E1#1 F18FE#1



LECTURE ARCHIVE

- Videos and Lecture Notes posted on Brightspace
- Also posted on personal webpage: https://www.math.purdue.edu/~kthod/lecture_archive_ma261_fa23.html

LECTURE ARCHIVE

MA 26100 • FALL 2023

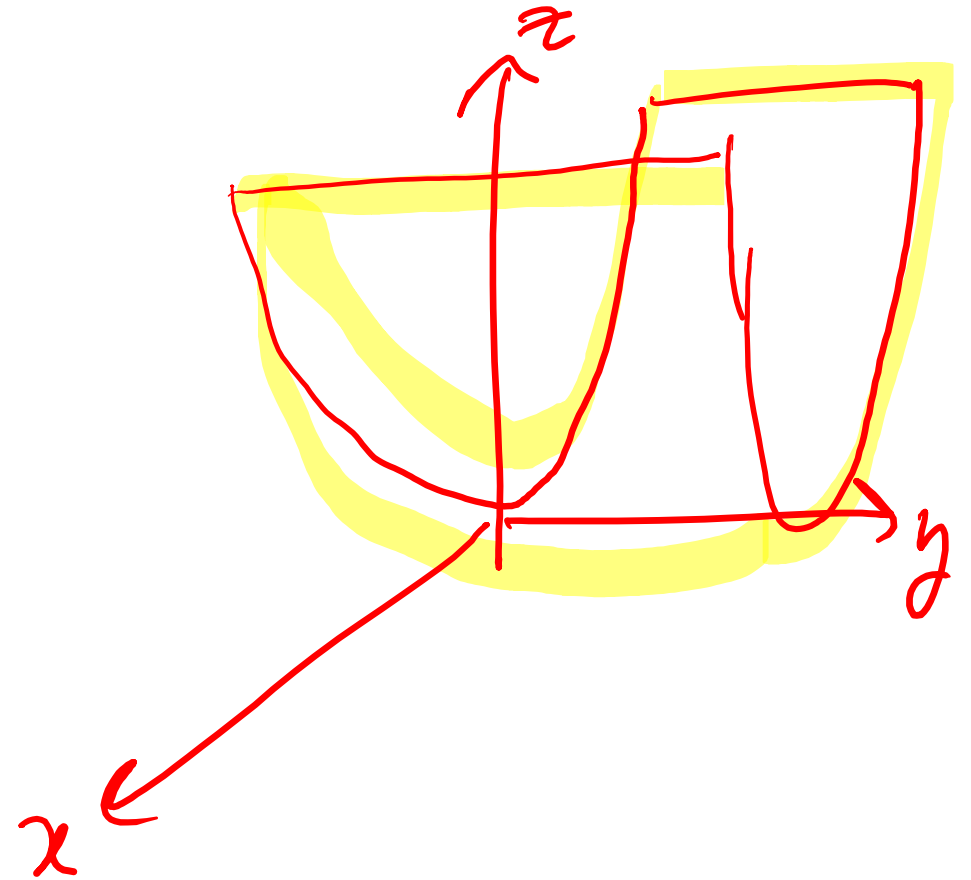
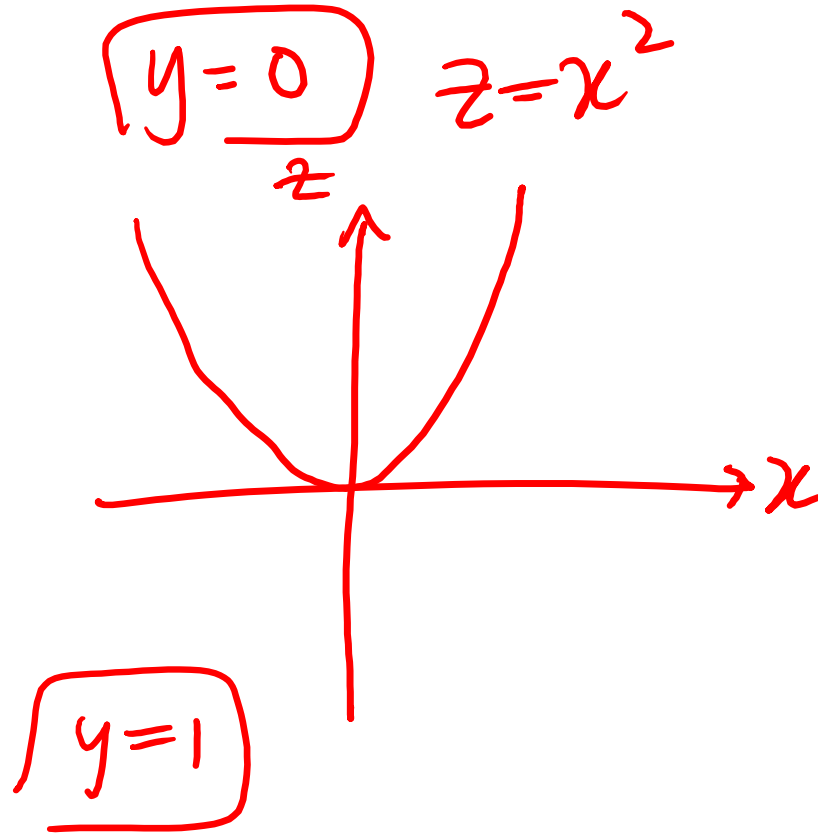
This table includes the Day, Date, Lesson Title, and links to the Lecture Videos, Lecture Notes, and Lecture Slides

Day	Date	Lecture Title	Lecture Video	Lecture Notes	Lecture Slides
Fri	8/25	Lesson 3: Cylinders & Quadric Surfaces, Part I (Sec 13.6)		<u>Notes: Quadric Surfaces</u>	
Wed	8/23	Lesson 2: Lines & Planes in Space (Sec 13.5)	<u>Video</u>	<u>Class Notes</u> <u>Notes: Lines with Common Point</u>	<u>Slides</u>
Mon	8/21	Lesson 1: Review of Vectors (Sec 13.1 - 13.4)	<u>Video</u>	<u>Class Notes</u> <u>Notes: Review of Vectors</u>	<u>Slides</u>
MA 162 (Calc 2 Lectures)	Spring 2023	Lecture: Vectors in 2D (Sec 13.1)	<u>Video 13.1</u>	<u>Notes 13.1</u>	<u>Slides 13.1</u>
		Lecture: Vectors in 3D (Sec 13.2)	<u>Video 13.2</u>	<u>Notes 13.2</u>	<u>Slides 13.2</u>
		Lecture: The Dot Product (Sec 13.3)	<u>Video 13.3</u>	<u>Notes 13.3</u>	<u>Slides 13.3</u>
		Lecture: The Cross Product (Sec 13.4)	<u>Video 13.4</u>	<u>Notes 13.4</u>	<u>Slides 13.4</u>

POLL 1

Consider the cylinder $z = x^2$. Which coordinate axis is it parallel to?

- a) x -axis
- b) y -axis
- c) z -axis



POLL 2

Consider the quadric surface

$$\frac{x^2}{9} + \frac{y^2}{4} + \frac{z^2}{9} = 1$$

What is the trace when $y = 0$?

- a) Ellipse
- b) Circle
- c) Hyperbola
- d) Parabola

POLL 3

Consider the quadric surface

$$z = \frac{x^2}{25} + \frac{y^2}{4}$$

What is the trace when $x = 0$?

- a) Ellipse
- b) Circle
- c) Hyperbola
- d) Parabola

MUDDIEST POINTS

What was the muddiest point from today's lecture?

- a) Cylinder
- b) Trace
- c) Ellipsoid
- d) Elliptic Paraboloid
- e) None – understood everything today