



LESSON 9

MA 26100-FALL 2023

DR. HOOD

LESSON 9 - WARM UP

(Fall 2016 Exam 1 #6) The curvature of the curve

$$\vec{r}(t) = \langle 9 \cos(t), 9 \sin(t) \rangle$$

circle
 $R=9$

At $t = \pi$ is:

a) 9

b) 3

c) $\frac{1}{3}$

d) $\frac{1}{9}$

$$K = \frac{1}{R} = \frac{1}{9}$$

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 UNIV 001	Thu @ 4:30 PM 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

POLL 1

$$f(x, y) = c$$
$$c = x + \sqrt{x^2 + y^2 + 1}$$
$$(c - x)^2 = (\sqrt{x^2 + y^2 + 1})^2$$

(Fall 18 Exam 1 #7) The level curves of

$$f(x, y) = x + \sqrt{x^2 + y^2 + 1}$$

are:

a) Hyperbolas

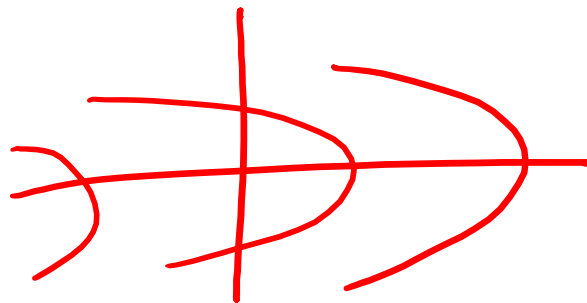
b) Ellipses

c) Sometime lines and sometimes ellipses

d) Circles

e) Parabolas

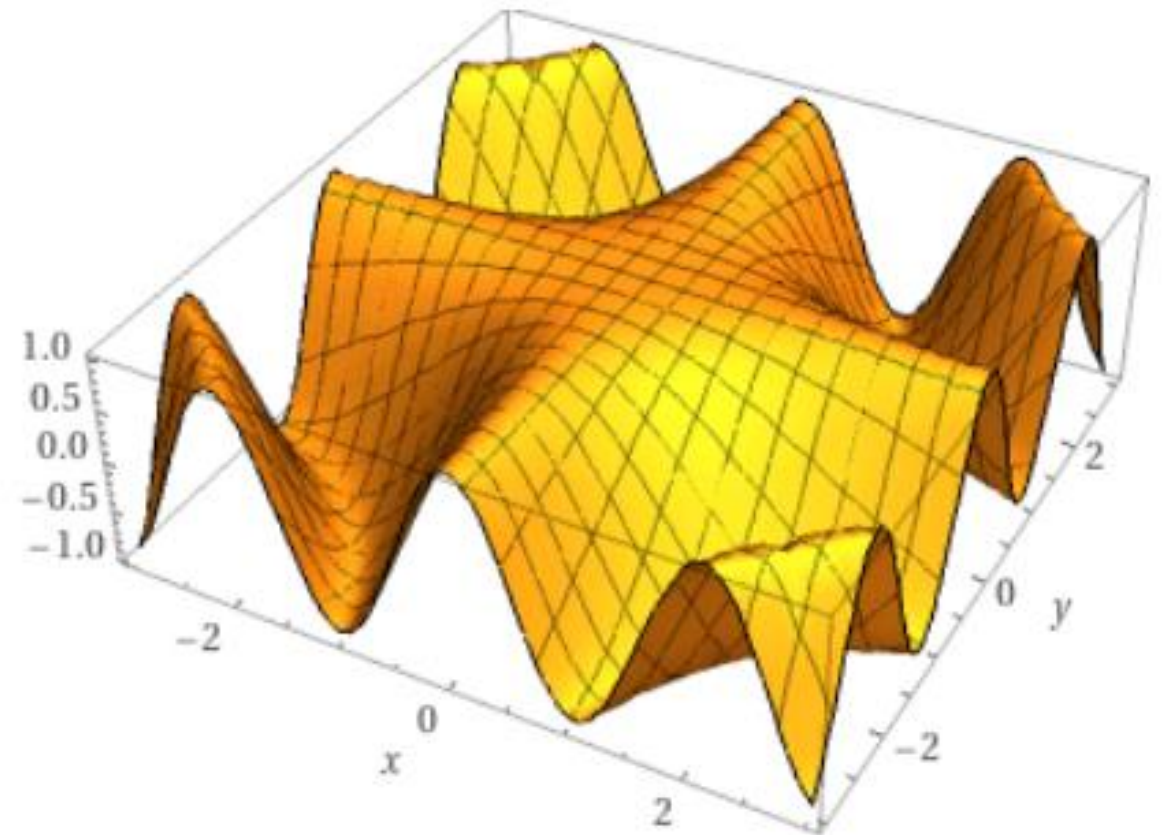
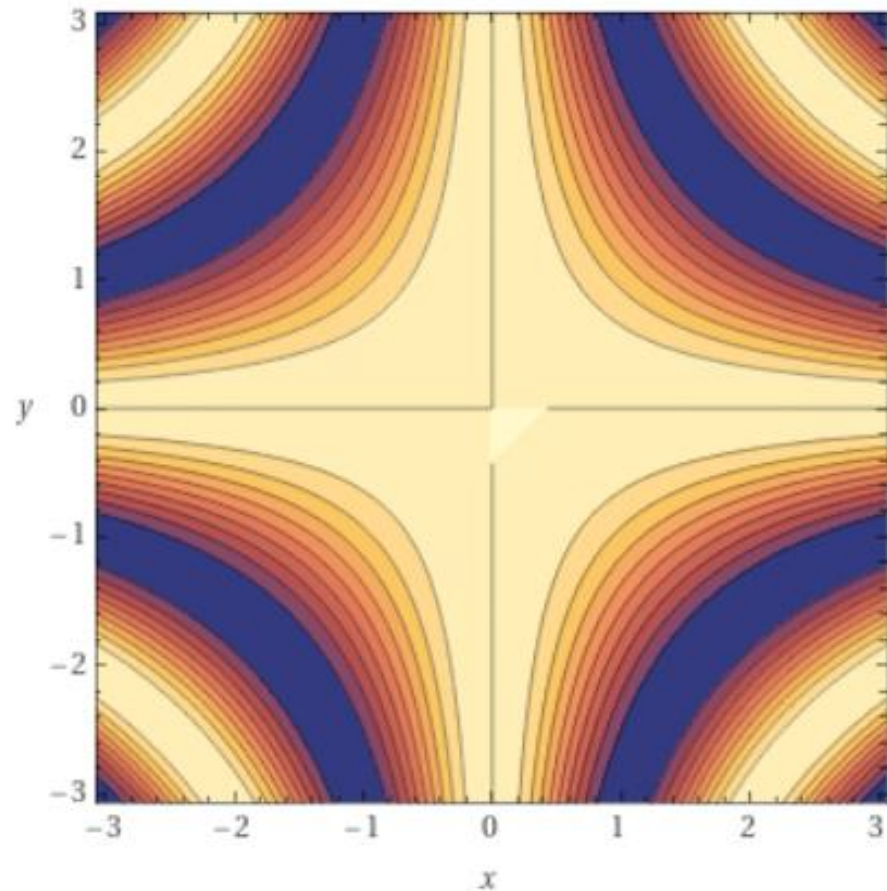
$$c^2 - 2cx + \cancel{x^2} = \cancel{x^2} + y^2 + 1$$
$$-2cx = y^2 + 1 - c^2$$



$$x = \frac{y^2 + 1 - c^2}{-2c}$$

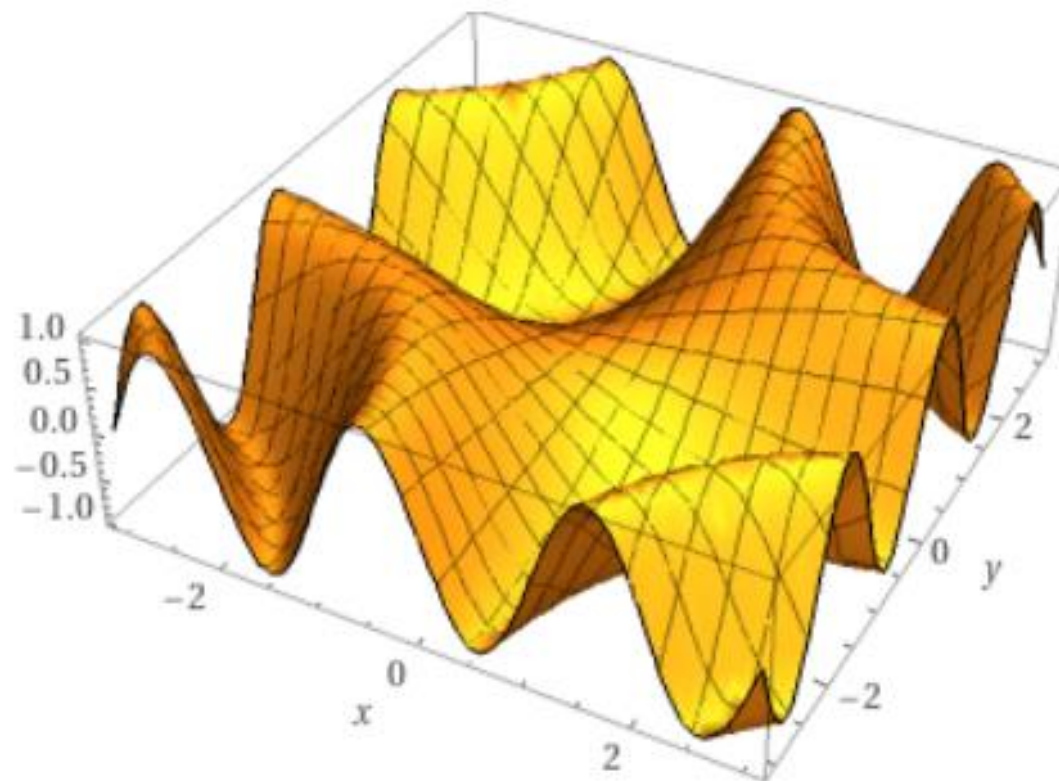
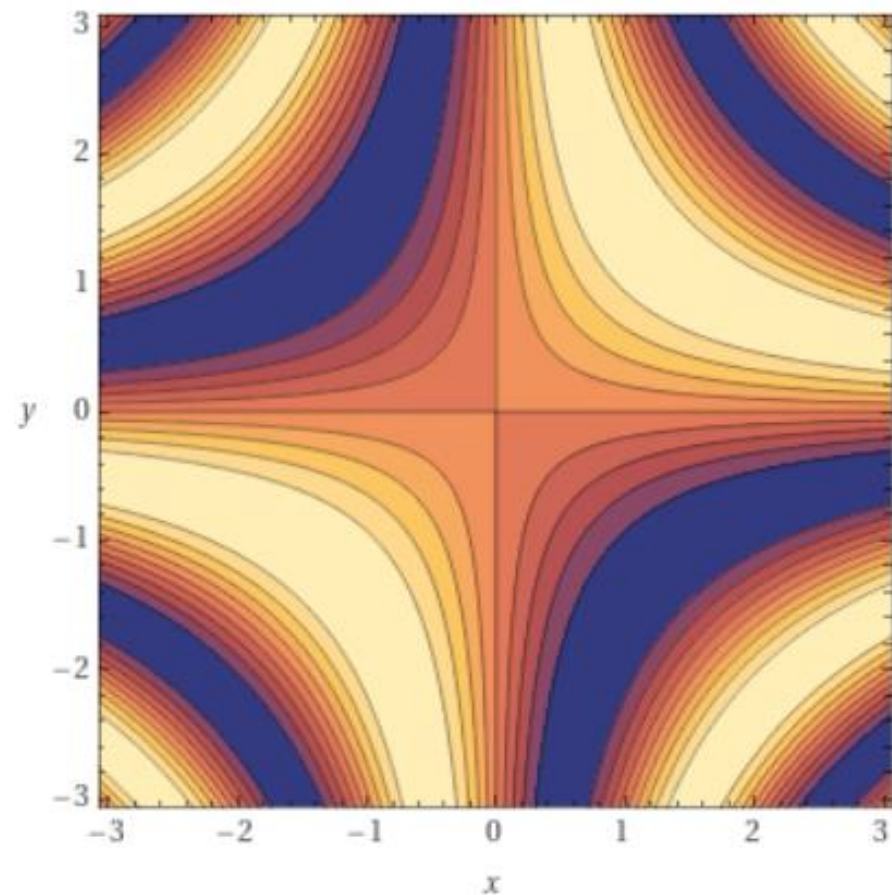
PLOTTING SURFACES

Sketch the level curves and surface of $z = \cos(xy)$



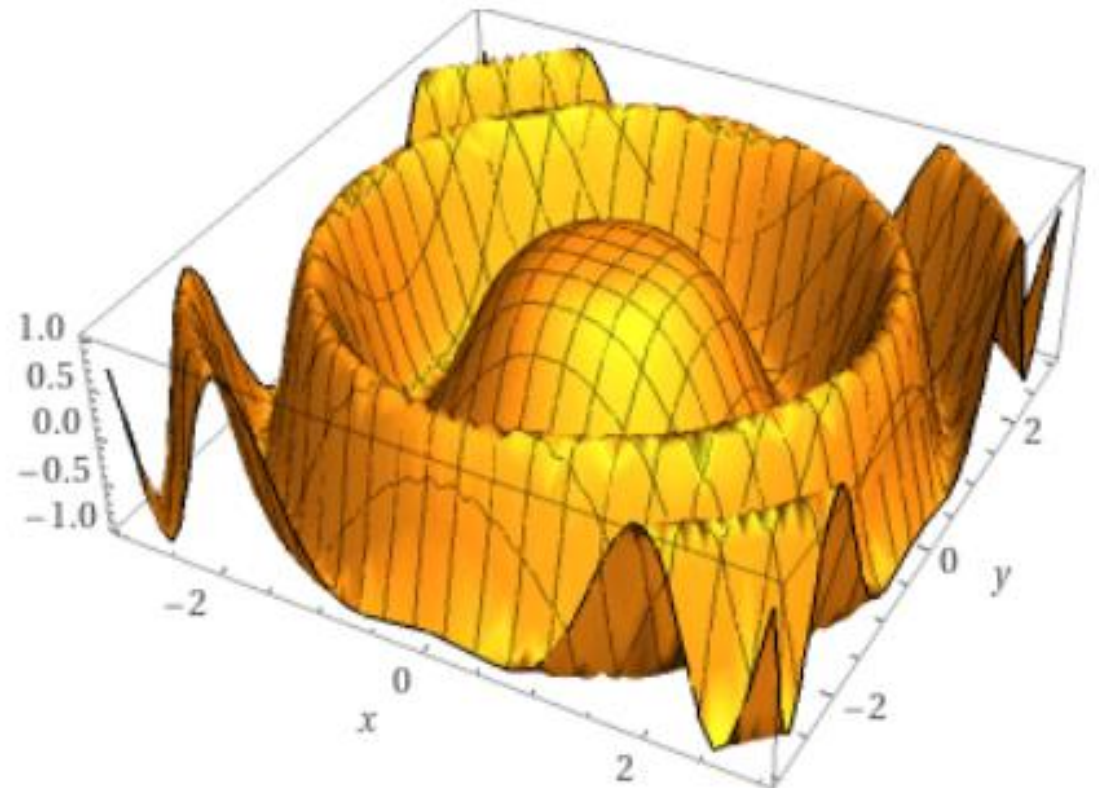
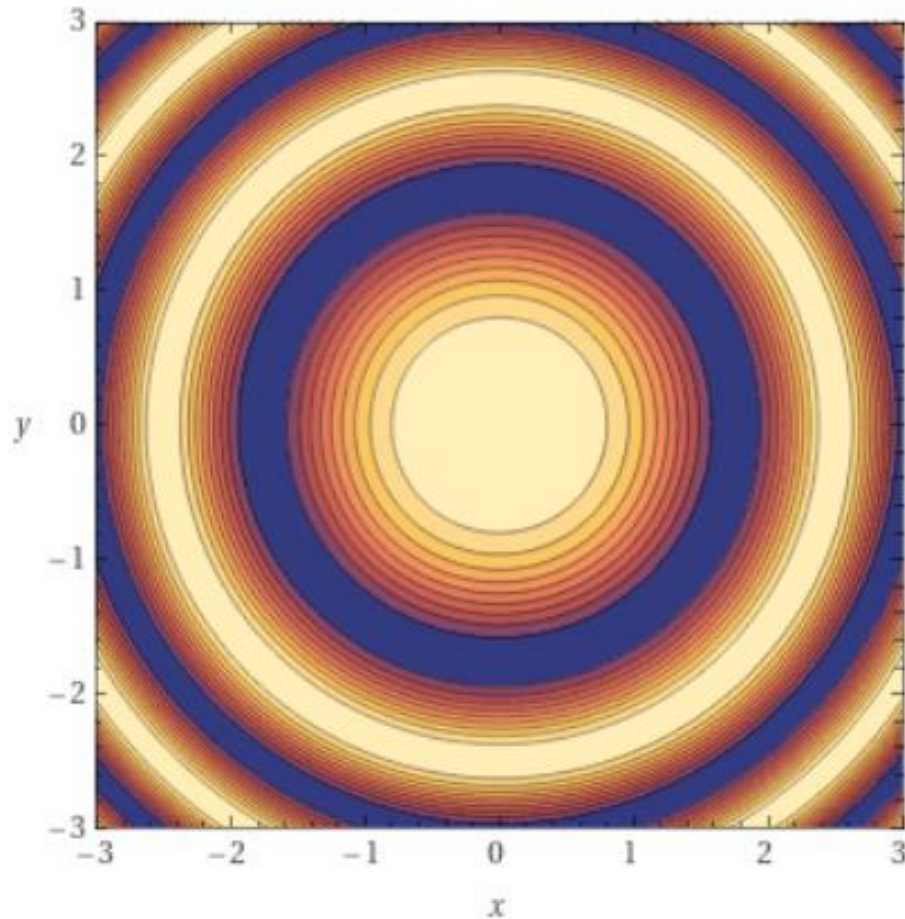
PLOTTING SURFACES

Sketch the level curves and surface of $z = \sin(xy)$



PLOTTING SURFACES

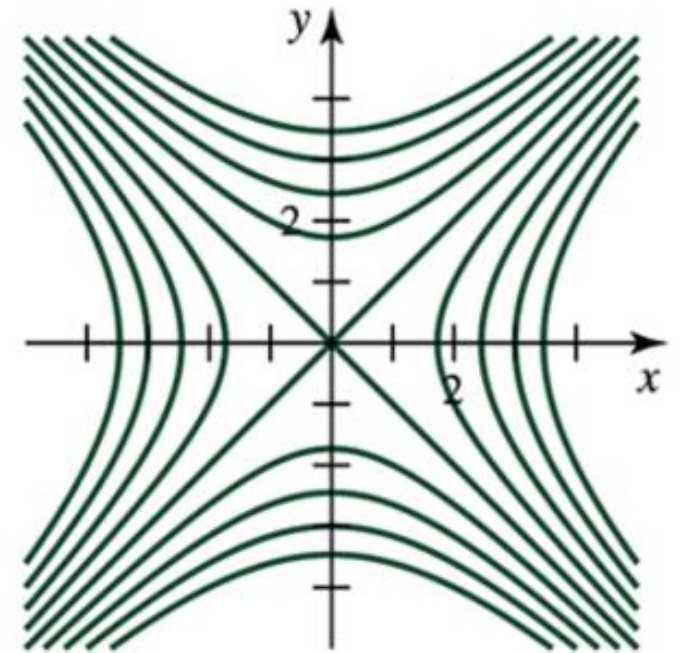
Sketch the level curves and surface of $z = \cos(x^2 + y^2)$



POLL 2

(Spring 22 Exam 1 #5) Suppose $z = f(x, y)$ has level curves shown here. The surface formed by the graph of f could be which of the following?

- a) Hyperbolic paraboloid
- b) Hyperboloid of 2 sheets
- c) Elliptic paraboloid
- d) Elliptic cone



MUDDIEST POINT

What was the muddiest point from today's lecture?

- a) Function of two variables
- b) Level curves
- c) Plotting surfaces
- d) None – understood everything today