

NOTE: Only registered students can have a seat (we will fill the room).

126: Calculus III - Dr. Andy Loveless
1st Homework (6-8 hours of work)

Closing Tues, Apr. 1: 12.1, 12.2, 12.3

Closing Thur, Apr. 3: 12.4(1)(2), 12.5(1)

Entry Task:

A) How can you tell if a point (x,y,z) in \mathbb{R}^3 is on...

1. ...the xy-plane?
2. ...the yz-plane?
3. ...the xz-plane?
4. ...the z-axis?
5. ...the y-axis?
6. ...the x-axis?
7. ...the origin?

Distances

The distance (in a straight line) between two points in \mathbb{R}^3 is

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2}$$

B) How far is $(1,3,4)$ from...

1. ...the origin?
2. ...the xy-plane?
3. ...the x-axis?

Homework Hint (12.1/4,5,6)

There is a way to answer the following questions using only the distance formula: Given three points

$$A(a_1, a_2, a_3), B(b_1, b_2, b_3), C(c_1, c_2, c_3)$$

1. Are all three points on the same line?
2. Do the three points form a right triangle?

Spheres (HW 12.1/7-16)

The equation of all points (x, y, z) on a sphere (*i.e.* the outer shell of a ball) centered at (h, k, l) with radius r is

$$(x - h)^2 + (y - k)^2 + (z - l)^2 = r^2$$

Example: Find the equation of the sphere that has its lowest point at $(0,0,1)$ and its highest point at $(0,0,5)$.

Example: Find the center and radius
of the sphere

$$2x^2 + 2y^2 + 2z^2 = 26 + 12x$$

What we will do in this course:

1. Ch. 12 – Vectors and 3D Basics
(vector operations, lines & planes)
2. Ch. 10, 13 – 2D and 3D Curves
(parametric, polar, dis/vel/acc)
3. Ch. 14 – Analyzing Surfaces
(partials, tangents, max/min)
4. Ch. 15 – Volumes under Surfaces
(double Integrals)

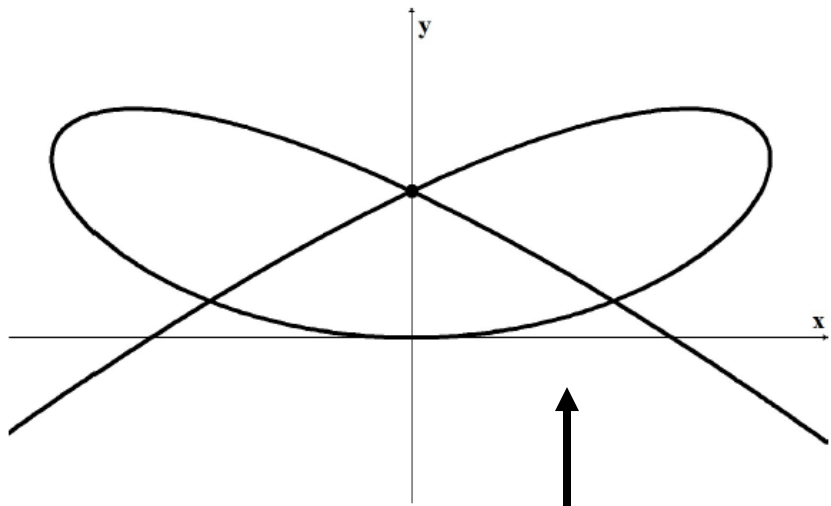
5. Taylor Notes – Taylor Polynomials
and Taylor Series

How to get help: First, work ahead on homework; pretend the closing date is actually two days early.

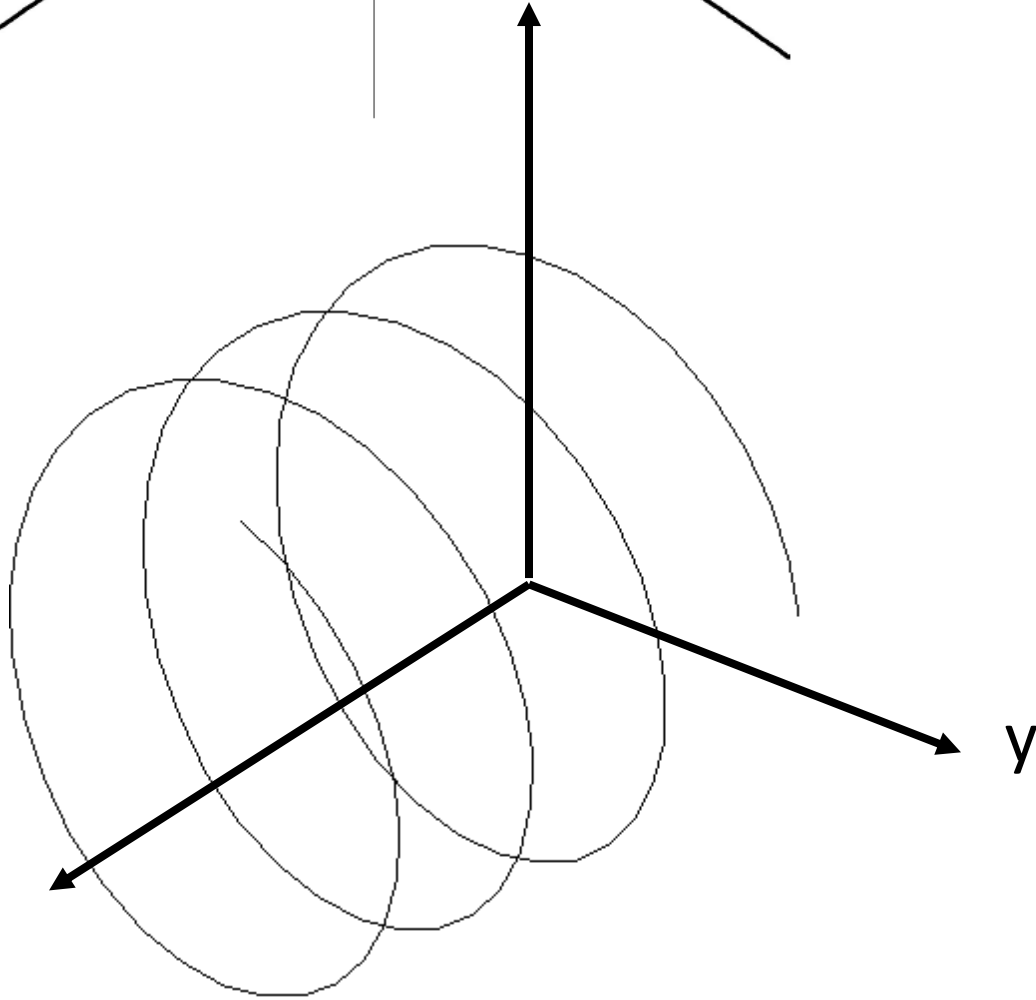
1. Ask questions in quiz section.

2. Math Study Center – Comm. B-014
Mon – Thurs: 9:30am-9:30pm
Fri : 9:30am-1:30pm
Sun: 2:00pm-6:00pm
3. CLUE – Mary Gates Commons
Sun – Thurs: 7pm-midnight
4. Work in study groups.
5. Visit your TA's office hours.
6. Visit my office hours.
7. If you have tried all these other things, then email me.

Ch. 10



Ch. 13



Ch. 14/15

