Turn In Problems

Math 280A-Math 280B, Spring 2008

1.2 (9.1) Due Jan 25: Exercise 48 on page 582. [Use a trigonometric identity on $\sin\left(\frac{2\pi}{3}-\theta\right)$].

2.1 Week 2, Due Tuesday:

1. (9.2) Exercise 21 on page 586.
2. (9.3) Exercise 16 on page 590.

2.2 Week 2, Due Friday, February 1

1. (9.4) Exercise 64 on page 598.
2. (10.1) The two spheres $x^2+y^2+z^2=1$ and $(x-2)^2+y^2+z^2=4$ intersect in a circle.
   (a) Describe that intersection with a single equation or with a pair of equations.
   (b) Give the radius and center of the circle of intersection.

3.1 Week 3, Due Tuesday, February 5

1. (10.2) Exercise 48 on page 627. [Just do the special case where $p=3$, $q=5$ and the distance between points P_1 and P_2 is known to be 16.]
2. (10.3) Exercise 28 on page 635.

3.2 Week 3 (EXAM WEEK – DO NOT TURN IN)

4.1 Week 4, Due Tuesday, February 12

1. (10.4) Exercise 34 on page 642.

4.2 Week 4, Due Friday, February 15

1. (10.5) Exercise 73 on page 651 (or you can do Exercise 74 instead if computer graphics strikes you as interesting).

5.1 Week 5, Due Tuesday, February 19

1. (10.6) Exercise 45 on page 656
2. (13.7) A solid lies above the cone $z=\sqrt{x^2+y^2}$ and below $x^2+y^2+z^2=z$.
   (a) Write a description of the solid in terms of inequalities involving cylindrical coordinates.
   (b) Write a description of the solid in terms of inequalities involving spherical coordinates.

5.2 Week 5, Due Friday, February 22

1. (11.1) Exercise 29 on page 671.

2. (11.2) Exercise 28 or Exercise 30 on page 678.

6.1 Week 6, Due Tuesday, February 26

1. Deferred to Week 7. (11.3) Exercise 19 on page 682.

6.2 Week 6 (EXAM WEEK)

7.1 Week 7, Due Tuesday, March 4

1. (11.3) Exercise 19 on page 682.
2. (11.4) The position of a particle at time $t \geq 0$ is given by $x = e^{-t}\cos(t)$, $y = e^{-t}\sin(t)$, $z = e^{-t}$
   (a) Explain why the particle spirals down the upper half of the cone $z^2 = x^2 + y^2$ toward the origin. Where does the spiral start?
   (b) Show that the curvature is $\kappa = \frac{\sqrt{2}}{3}e^t$. How does this behave as $t \to \infty$? Explain why this makes sense.

7.2 Week 7, Due Friday, March 7

1. (11.5) The position of a particle at time $t \geq 0$ is given in cylindrical coordinates by $r = t$, $\theta = t$, $z = t$.
   (a) Explain why the particle spirals up and around the upper half of the cone $z^2 = x^2 + y^2$.
   (b) Find $\mathbf{T}, \mathbf{N}$, and $\mathbf{B}$ at time $t = 0$ and the equation of the osculating plane when $t = 0$.
2. (12.1) Exercise 43 on page 710.

8.1 Week 8, Due Tuesday, March 11

1. (12.2) Instead of $\varepsilon = 0.01$,work exercise 59 on page 719 using an arbitrary positive number ε.By this I mean, use the letter ε in your proof and find a function δ that takes ε as an input and outputs a number satisfying

$$\sqrt{x^2 + y^2} < \delta \Longrightarrow |f(x, y) - f(0, 0)| < \varepsilon$$

8.2 Week 8, Due Friday, March 14

1. (12.3) Exercise 62 on page 730.

Spring Break Week March 17– 21

9.1 Week 9, Due Tuesday, March 25

1. (12.4) Exercise 42 on page 738

9.2 Exam Week – No Friday Homework

10.1 Week 10, Due Tuesday, April 1

1. (12.5) Exercise 33 on page 747.
2. (12.6) Exercise 55 on page 756.

10.2 Week 10, Due Friday, April 4

1. (12.7) Exercise 55 on page 764.

11.1 Week 11, Due Tuesday, April 8

1. (12.8) Exercise 42 on page 774

11.2 Week 11, Due Friday, April 11

1. (13.1) Exercise 28 on page 790.

12.1 Week 12, Due Tuesday, April 15

1. (13.2) Exercise 54 on page 798.

12.2 Exam Week - No Friday Homework

13.1 Week 13, Due Tuesday, April 22

1. (13.3) Exercise 14 on page 801
2. (13.4) Exercise 31 on page 806

13.2 Week 13, Due Friday, April 25

1. (13.5) Number 43 on page 816

14.1 Week 14, Due Tuesday, April 29

1. (13.7) Number 55 on page 836

14.2 Week 14, Due Friday, May 2

1. (13.8) Number 9 on page 845
2. (14.1) Number 25 on page 856

15.1 Week 15, Due Tuesday, May 6

1. (14.2) Number 44 on page 867

Not to be Turned In 1. (14.3) Number 31 on page 877

2. (14.4) Number 33 on page 886