University of Delaware
Department of Mathematical Sciences

MATH-243 – Analytical Geometry and Calculus C
Instructor: Marco A. Montes de Oca
Spring 2012

Homework 6

Name: _____ **Section:** _____

Due date: March 1, 2012 (Section 50)
February 29, 2012 (Section 51)

Problems

Taken or adapted from Section 12.5 of the book *MATH 241/242/243 University of Delaware* by J. Stewart. Each exercise is worth 10 points for a total of 100 points.

1. Exercise # 12.5–6. Find the parametric equations and symmetric equations for the line that passes through the origin and the point $(1, 2, 3)$.

2. Exercise # 12.5–10. Find the parametric equations and symmetric equations for the line that passes through the point $(2, 1, 0)$ and is perpendicular to both $\hat{i} + \hat{j}$ and $\hat{j} + \hat{k}$.

3. Exercise # 12.5–30. Find an equation of the plane that contains the line $x = 3 + 2t$, $y = t$, $z = 8 - t$ and is parallel to the plane $2x + 4y + 8z = 17$.

4. Exercise # 12.5–34. The plane that passes through the point $(1, 2, 3)$ and contains the line $x = 3t$, $y = 1 + t$, $z = 2 - t$.

5. Exercise # 12.5–44. Find the point at which the line $x = 1 + 2t$, $y = 4t$, $z = 2 - 3t$ intersects the plane $x + 2y - z + 1 = 0$.

6. Exercise # 12.5–54. Find the angle between the planes $x + 2y + 2z = 1$ and $2x + y - 3z = 3$.

7. Exercise # 12.5–56. Find the parametric equations for the line of intersection of the planes $3x - 2y + z = 1$ and $2x + y - 3z = 3$. Find also the angle between these planes.

8. Exercise # 12.5–61. Find an equation of the plane with x-intercept equal to a, y-intercept equal to b, and z-intercept equal to c.

9. Exercise # 12.5–68. Find the distance from the point $(0, 1, 3)$ to the plane $x - 2y - 4z = 8$.

10. Exercise # 12.5–75. Show that the lines with symmetric equations $x = y = z$ and $x + 1 = \frac{y}{2} = \frac{z}{3}$ are skew, and find the distance between these lines.