MEMORIAL UNIVERSITY OF NEWFOUNDLAND DEPARTMENT OF MATHEMATICS AND STATISTICS

ASSIGNMENT 9 MATH 2050 sect. 3 DUE NOV 30

For practice and extra credit only.

- 1. Use vectors addition to show that
 - (a) In a regular hexagon ABCDEF, $\vec{AB} + \vec{AC} + \vec{AE} + \vec{AF} = 2\vec{AD}$
 - (b) In a regular *n*-gon $A_1 \cdots A_n$ with center O and even number of vertices the sum $\sum_{k=1}^n O\vec{A}_k = 0.$
- 2. Give a definition of
 - unit vector;
 - dot product of two vectors;
 - cross product of two vectors;
 - projection of one vector onto another vector.
- 3. Find the projection of vector $\vec{v} = (2, 5, 7)$ onto vector $\vec{u} = (-2, 1, 3)$, and the angle between them.
- 4. A line goes via points (1, 2, 3) and (6, 5, 4). Another line goes through points (3, 2, 1) and (4, 5, 6).
 - (a) Do the two lines intersect? If yes, what is the point of intersection?
 - (b) Find the distance of each line from the origin.
- 5. Find equation of a plane which contains points (1, 0, 1), (1, 2, 0), (0, 3, 1).
- 6. Find area of the quadrilateral with vertices (-1, -1), (2, 0), (3, 4), (-3, 5).
- 7. Give an example of two lines which intersect at point (0, -1, 3) at the right angle. Justify.
- 8. Give an example of a plane which is orthogonal to the plane 2x + 3y 4z = -5. Explain.