

MA 2733

Worksheet 10 – November 11, 2015

Name \_\_\_\_\_

1. Find a unit normal vector (that is, a normal vector that is also a unit vector) to the plane containing the points  $(2, 1, 1)$ ,  $(1, 1, 1)$ , and  $(1, 3, 1)$ .

2. Show that if  $\vec{v} + \vec{u} + \vec{w} = \vec{0}$ , then  $\vec{v} \times \vec{u} = \vec{u} \times \vec{w}$ .

3. For each of the following sets of points, determine whether the points lie all on a line, all on a plane, or neither:

(a)  $(0, 0, 0)$ ,  $(1, 2, 3)$ ,  $(3, 2, 1)$ ,  $(1, 1, 1)$

(b)  $(1, 1, 1)$ ,  $(2, 1, 1)$ ,  $(3, 1, 1)$ ,  $(4, 1, 1)$

(c)  $(1, 0, 1)$ ,  $(2, 2, 4)$ ,  $(4, 2, 2)$ ,  $(2, 1, 2)$

4. (a) For the surface  $z = x^2 + \sin y$ , find several traces parallel to the  $xz$ - and  $yz$ -planes. (You might not be able to find a good description of the traces parallel to the  $xy$ -plane here.)
- (b) Using your traces, sketch and/or describe the resulting surface.