

# Calc 3 - Assignment #2

Note Title

9/8/2011

① Find  $\vec{a} + \vec{b}$ ,  $2\vec{a} + 3\vec{b}$ ,  $\|\vec{a}\|$ , and  $\|\vec{a} - \vec{b}\|$  for

a)  $\vec{a} = 4\vec{i} + \vec{j}$ ,  $\vec{b} = \vec{i} - 2\vec{j}$

b)  $\vec{a} = \vec{i} + 2\vec{j} - 3\vec{k}$ ,  $\vec{b} = -2\vec{i} - \vec{j} + 5\vec{k}$

c)  $\vec{a} = 2\vec{i} - 4\vec{j}$ ,  $\vec{b} = 2\vec{j} - \vec{k}$

② Find a unit vector that has the same direction as:

a)  $-3\vec{i} + 7\vec{j}$

b)  $8\vec{i} - \vec{j} + 4\vec{k}$

③ If  $\vec{v}$  lies in the 1<sup>st</sup> quadrant of  $\mathbb{R}^2$  and

makes an angle of  $\pi/3$  with the x-axis

and  $\|\vec{v}\| = 4$ , find  $\vec{v}$  in component form, i.e.

$\vec{v} = \langle a, b \rangle$ , where  $a, b$  are the components to find.

④ Find the unit vectors parallel to the

tangent line to the parabola  $y = x^2$  at

the point  $(2, 4)$ .

⑤ If  $A, B, C$  are the vertices of a triangle,

find  $\vec{AB} + \vec{BC} + \vec{CA}$

⑥ If  $\vec{r} = \langle x, y, z \rangle$  and  $\vec{r}_0 = \langle x_0, y_0, z_0 \rangle$ ,

describe the set of all points  $(x, y, z)$  such

that

$$\|\vec{r} - \vec{r}_0\| = 1$$