MATH 332
Quiz 1
January 22, 1988

Name _____ wed 23/25 make-up form (3)

1. Find the components of the vector with initial point (2,-1) and terminal point (-3,4).

$(-3-2, 4-(-1)) = (-5, 5)$

2. Given the vectors $\vec{u} = (2,1,3)$, and $\vec{v} = (-2,2,1)$, find:

a. $\vec{u} + \vec{v} =$ $(0, 3, 4)$

b. $3\vec{u} =$ $(6, 3, 9)$

2 cm

c. $\|\vec{v}\| =$ $\sqrt{2^2+2^2+1^2} = 3$

d. $\vec{u} \cdot \vec{v} =$ $2(-2) + 1(2) + 3(1) = -4 + 5 = 1$

f. $3\vec{u} + 6\vec{v} =$

$(6, 3, 9) + (-12, 12, 6)$

$(-6, 15, 15)$

e. the orthogonal projection of $\vec{u}$ onto $\vec{v}$ is

$$\frac{u \cdot v}{v \cdot v} \vec{v} = \frac{1}{9}(-2,2,1) = \left(\frac{2}{9}, \frac{2}{9}, \frac{1}{9}\right)$$

3. Find the equation of the plane through the point (0,2,-1) which is parallel to the plane $x - 2y + z = 5$.

$n = (1, -2, 1)$

$(1,-2,1) \cdot (x-0, y-2, z+1) = 0$

$x - 2(y-2) + z + 1 = 0$

$x - 2y + 4 + z + 1 = 0$

$x - 2y + z = -5$

4. Are the vectors $\vec{a} = (1,2,-3)$ and $\vec{b} = (2,1,1)$ orthogonal? Justify.

$(1,2,-3) \cdot (2,1,1)$

$= 2 + 2 - 3 = 1 \neq 0$

NO.