Math 233 Warm Up Problems
August 28, 2009

1. Find the equation of the sphere in $\mathbb{R}^3$ with radius $\pi$ and center at $(\sqrt{2}, -7, \sqrt{\pi})$.

2. Find the unit vector in the direction of the given vector

\[ V = (4, -2, 7) \quad U = \]

Lecture Problems

3. Let $A = (12, -1, 5)$ and $B = (-1, 2, 1)$.
   (a) Find the component of $A$ along $B$.
   (b) Find the vector projection of $A$ along $B$.
   (c) Find the scalar projection of $A$ along $B$.
   (d) Find the orthogonal projection of $A$ along $B$.

4. Let $A = (8, 1, -2)$ and $B = (1, 4, -3)$.
   (a) Find the component of $A$ along $B$.
   (b) Find the vector projection of $A$ along $B$.
   (c) Find the scalar projection of $A$ along $B$.
   (d) Find the orthogonal projection of $A$ along $B$.

5. Find the angle (in radians) between the two vectors in $\mathbb{R}^4$:

\[ v_1 = (1, -2, -3, 1), \quad v_2 = (4, 5, -1, 2) \]