

Math 211 More Practice with Vectors

1. Find the center and radius of the sphere $x^2 + y^2 + z^2 + 4x + 6y - 10z + 2 = 0$.
2. Find two unit vectors perpendicular to the vector $\mathbf{v} = \langle -2, 3 \rangle$.
3. Find two unit vectors parallel to the curve $y = x^3 - 2x$ at the point $(2, 4)$.

4. Let $\mathbf{u} = \langle 1, -1 \rangle$ and $\mathbf{v} = \langle -2, 3 \rangle$.

a) Find the angle of intersection of these two vectors.

b) Find the projection of \mathbf{u} onto \mathbf{v} .

c) Find the projection of \mathbf{v} onto \mathbf{u} .

d) If $a\mathbf{u} + b\mathbf{v} = \langle 12, -17 \rangle$, what are a and b ?