Name: Score: /8

Math 1321 Week 4 Worksheet Due Thursday 09/25

1. Find Taylor series for antiderivative of $\ln(1+x^2)$ at $a=0$ using known series (i.e. Table 1 on page 613).

2. Find Taylor series for $f(x)=e^{3x}$ at $a=2$.

3. What is the difference between a vector and a scalar? Give examples of a vector and a scalar in physics.

4. If $\mathbf{u}$ is a vector and c is a scalar, how are $c\mathbf{u}$ and $\mathbf{u}$ related. Draw a picture to accompany your answer.

5. Prove that $\mathbf{w} \cdot (\mathbf{u} + \mathbf{v}) = \mathbf{w} \cdot \mathbf{u} + \mathbf{w} \cdot \mathbf{v}$, where $\mathbf{u}, \mathbf{v}, \mathbf{w} \in \mathbb{R}^2$.

6. Prove that if two vectors are orthogonal, then the dot product is zero.

7. Prove that $|\mathbf{u} \cdot \mathbf{v}| \leq |\mathbf{u}||\mathbf{v}|$.

8. Compute the angle between the diagonal of a cube and one of its faces.