Homework 1: 1.1-1.2

Directions: Do each of the following problems on your own paper. Calculators are allowed, but exact answers must be given unless otherwise specified and all answers must be supported analytically. Each problem is worth 10 points (5 pts for attempt).

1. Given triangle $ABC$, let $D$ be the midpoint of $AB$ and $E$ be the midpoint of $BC$. Use vectors to prove that $DE \parallel AC$ and $DE = \frac{1}{2}AC$.

2. Given the points $A(1, 2), B(6, 1), C(−1, −2)$, find the scalar projection of vector $AB$ (from $A$ to $B$) onto the vector $AC$.

3. A constant force $F = −3\mathbf{i} + 5\mathbf{j}$ moves an object along a straight line from the point $(2, 3)$ to the point $(0, 5)$. Find the work done if the force is in Newtons and the distance is in meters.

4. Also hand in: 1.1 #2, 16, 34; 1.2 #10, 30, 36, 60