Week 2: Vectors

Welcome to the Weekly Review for MATH 2414. This week’s review talks about Vectors. We would like to thank Patrick Bourque and the Spring 2015 MATH 2414 students for allowing us to film the Weekly Reviews.

The following problems are presented in the Week 2 videos. Thank you!

Part A: Vectors

1. Do the points (1, 1), (3, 2) and (4, 9) form a Right Triangle, Acute Triangle or Obtuse Triangle?

2. A plane is flying N45°W (45° West of North) at 450 miles per hour. At some time, wind starts to blow at 85 miles per hour in the direction of S30°E. Find the resulting speed and direction of the plane.
3. Prove that for any triangle, the line connecting the midpoints of any two sides is parallel to the third side, with half the length of the third side.

4. Let $C$ be a point on the line segment $AB$ that is twice as far from $B$ as it is from $A$. For any point $O$ if $\overline{u} = \overline{OA}$, $\overline{v} = \overline{OB}$, $\overline{w} = \overline{OC}$. Show that $\overline{w} = \frac{2}{3}\overline{u} + \frac{1}{3}\overline{v}$.

5. Find $a$ so that $<\frac{1}{2}, a>$ is a unit vector.