Math 254 CLASS EXERCISES **4 April 2018**

1. Give the vector $\overrightarrow{PQ}$ from $P(5,-2,4)$ to $Q(1,1,1)$ and determine its magnitude $\|\overrightarrow{PQ}\|$. Give the magnitude in exact form.

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

   (a) Give $\|\vec{\mathbf{v}}\|$ in exact form.

   (b) Determine the vector $\vec{\mathbf{w}} = \dfrac{1}{\|\vec{\mathbf{v}}\|}\,\vec{\mathbf{v}}$.

   (c) Give $\|\vec{\mathbf{w}}\|$ in exact form.

4. Given that point R is $R(3, 1, -2)$ and $\overrightarrow{PR} = \langle 5, -2, 4 \rangle$, determine point P.

5. Let $\vec{\mathbf{v}} = \langle -3, 4 \rangle$.

   (a) Give the vector $\vec{\mathbf{u}}$ in the direction opposite $\vec{\mathbf{v}}$ and having magnitude four.

   (b) Give the vector $\vec{\mathbf{w}}$ in the direction opposite $\vec{\mathbf{v}}$ and having magnitude fouur times that of v.