University of British Columbia
Math 200, Section 103
Quiz 1; Friday, 16 September 2016
Student Name:
SID:

Time = 10 minutes. Notes and calculators are NOT allowed. This quiz is worth 6 points. You need to justify your answers; giving only the final answers without any explanation will give you no credit.
Make sure you have clearly written your name and SID before attempting these questions.

Question 1. Given two points $A(-1, 1, 0)$ and $B(2, 2, 1)$.
   
   (a) Find the coordinates (i.e. component form) of $\vec{AB}$. (1pt)
   
   (b) Find the unit vector having the opposite direction of $\vec{AB}$. (2pts)

Question 2. Given $A(-1, 1, 0)$ and $B(2, 2, 1)$ as above. Write down and simplify an equation that describes the set of points $P(x, y, z)$ that are equidistant to $A$ and $B$. (3pts)

1) a) $\vec{AB} = \langle 3, 1, 1 \rangle$

   b) $- \frac{\vec{AB}}{||\vec{AB}||} = \langle \frac{-3}{\sqrt{11}}, \frac{-1}{\sqrt{11}}, \frac{-1}{\sqrt{11}} \rangle$

2) Set $||PA|| = ||PB||$ or $||PA||^2 = ||PB||^2$

   $$\begin{align*}
   (x+1)^2 + (y-1)^2 + (z-1)^2 &= (x-2)^2 + (y-2)^2 + (z-1)^2 \\
   x^2 + 2x + 1 + y^2 - 2y + 1 + z^2 &= x^2 - 4x + 4 + y^2 - 4y + 4 + z^2 - 2z + 1 \\
   6x + 2y + 2z - 7 &= 0
   \end{align*}$$