Assignment Applications of Vectors   **NAME:**   Type equation here.

Step 0. Write your student ID. Your student ID has 9 digits. Let's call these digits from left to right: $x_1, x_2, x_3, \ldots x_9$.
[1 mark]

Step 1. Let's consider 3 points A, B and C in 3D space given by $A(x_1, -x_2, x_3)$, $B(-x_4, x_5, -x_6)$, and $C(x_7, -x_8, x_9)$.
Find the points A, B, and C corresponding to your student ID.   [1 mark]

Step 2. Find the displacement vector $\overrightarrow{AB}$.   [1 mark]

Step 3. Find the perimeter of the triangle ABC (the exact value and a decimal approximation).   [3 marks]
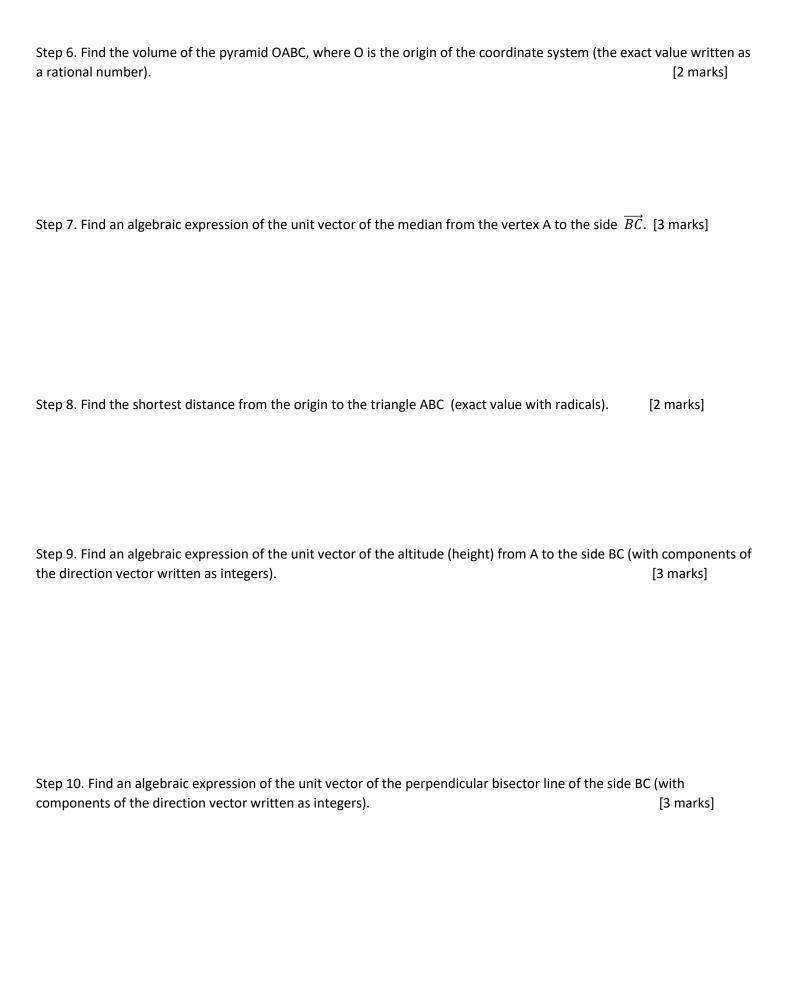
Step 4. Find the angle A of the triangle ABC (in degrees, with two decimal places).   [2 marks]

Step 5. Find the area of the triangle ABC (the exact value written as a rational number).   [2 marks]

Step 6. Find the volume of the pyramid OABC, where O is the origin of the coordinate system (the exact value written as a rational number).   [2 marks]

Step 7. Find an algebraic expression of the unit vector of the median from the vertex A to the side $\overrightarrow{BC}$. [3 marks]

Step 8. Find the shortest distance from the origin to the triangle ABC (exact value with radicals).   [2 marks]

Step 9. Find an algebraic expression of the unit vector of the altitude (height) from A to the side BC (with components of the direction vector written as integers).   [3 marks]

Step 10. Find an algebraic expression of the unit vector of the perpendicular bisector line of the side BC (with components of the direction vector written as integers).   [3 marks]

Step 11 Find an algebraic expression of the unit vector of the angle bisector from A.   [3 marks]

Step #	Answer
0	
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