1. Find the centre and radius of the sphere with equation 
   \[2x^2 + 2z^2 - 6y = 5x - 2y^2 + 7z + 9\]

2. Consider the intersection of the sphere \((x - 3)^2 + (y + 2)^2 + (z - 1)^2 = 13\) with the plane \(x + y = 0\).
   
   (a) This intersection should be a familiar curve. Describe the curve.
   (b) Substituting \(x = -y\) or \(y = -x\) into the equation of the sphere does not give this curve. Explain this difference.

3. Given \(u = \langle 2, -1, 3 \rangle\) and \(v = 3i + 5j - k\), find a unit vector in the direction of \(u + 2v\).

4. Given the triangle with vertices \(A(1,0,-3)\), \(B(2,2,5)\) and \(C(3,0,7)\), find the interior angles, to the closest degree.