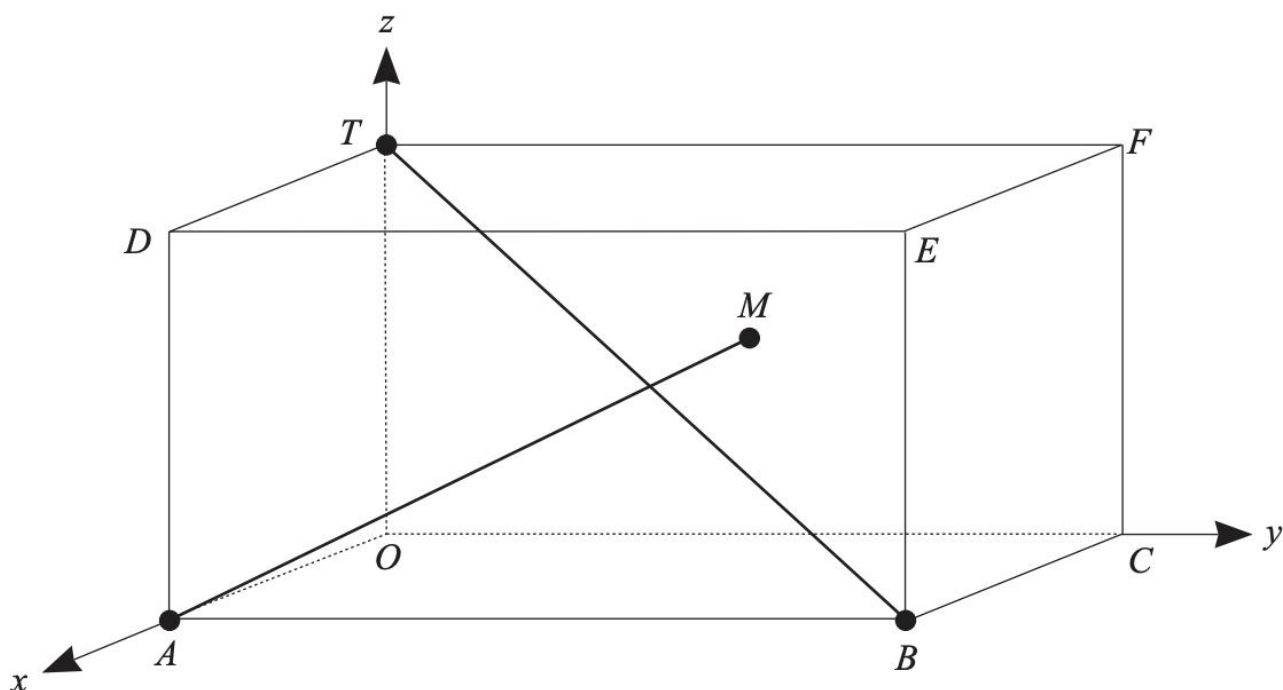


Question 16

(8 marks)

A rectangular prism is defined using the coordinate system shown with $A(2, 0, 0)$, $C(0, 4, 0)$ and $T(0, 0, 3)$. Point M is the centre of the planar face $OCFT$ with coordinates $(0, 2, 1.5)$.



- (a) Determine the vector equation for the prism's main diagonal \overrightarrow{BT} . (2 marks)

- (b) Determine the Cartesian equation of the sphere that contains all vertices of the rectangular prism. (3 marks)

- (c) Prove, using a vector method, that line \overleftrightarrow{AM} does **not** intersect \overleftrightarrow{BT} . (3 marks)