Geometry 5 - 3D Geometry Intro

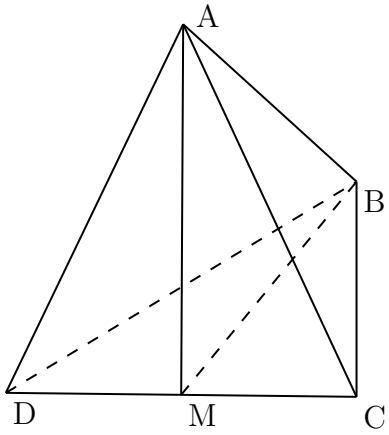
TSS Math Club

Nov 2022

1 3D Geometry: Think 2D

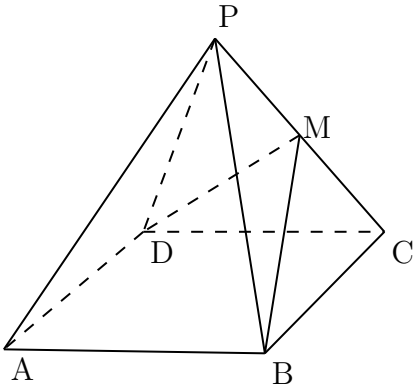
1.1 Example 1

In a regular tetrahedron $ABCD$, M is the midpoint of CD. Find $\angle AMB$.



1.2 Example

In the diagram, $PABCD$ is a pyramid with square base $ABCD$ and with $PA = PB = PC = PD$. Suppose that M is the midpoint of PC and that $\angle BMD = 90°$. Triangular-based pyramid $MBCD$ is removed by cutting along the triangle defined by the points M, B and D. The volume of the remaining solid $PABMD$ is 288. What is the length of AB?



1.3 Example

Three spheres with radii 11, 13, and 19 are mutually externally tangent. A plane intersects the spheres in three congruent circles centered at A, B, and C, respectively, and the centers of the spheres all lie on the same side of this plane. Suppose that $AB^2 = 560$. Find AC^2