September/October Solutions

Regular Tetrahedron

A regular tetrahedron is made up of equilateral triangles. If each side of a triangle is 36 the altitude is $18\sqrt{3}$. Dividing the triangle into six equal $30-60-90$ triangles, one can find that the distance from the base to the center is $6\sqrt{3}$. To find the altitude of the tetrahedron, form a right triangle with the altitude A as one side, the segment from the base to the center with length $6\sqrt{3}$ as one side, and the altitude of one of the triangles making up the faces of the tetrahedron with length $18\sqrt{3}$ as the hypotenuse. Then apply the Pythagorean Theorem:

$$\begin{aligned} A^2 + (6\sqrt{3})^2 &= (18\sqrt{3})^2 \\ A^2 + 108 &= 972 \\ A^2 &= 864 \\ A &= 12\sqrt{6} \end{aligned}$$

Correct Solutions

- Hudson Harper
- Kevin Ludwick (Answer not given in simplest radical form.)
- Jim Manning
- Joshua Hendrickson (Answer not given in simplest radical form.)
- Holly Watson (Answer not given in simplest radical form.)
- Andrew Shore (Answer not given in simplest radical form.)
- Joseph Montoya
- Oliver Gothe
- Dominik Gothe