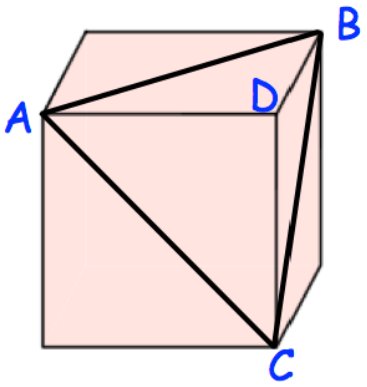
September 3rd

DA, DB and DC are the three edges of a cube that meet at corner D.

Express the volume of the tetrahedron ABCD as a fraction of the volume of the cube.



Let each side length =1cm

Therefore AB = BC = $\sqrt{2}$ cm

Since triangle ABC is equilateral, angle ABC=60°

Therefore area of ABC = ½ x $\sqrt{2}$ x $\sqrt{2}$ x sin 60 = $\frac{\sqrt{3}}{2}$

The height of the tetrahedron is a half of the cube's diagonal.

Using Pythagoras in three dimensions, the diagonal is $\sqrt{3}$ cm

So the height of the tetrahedron is $\frac{\sqrt{3}}{2}$ cm

Volume of any pyramid is $^1/_3$ base area x vertical height

So Volume ABCD = $^1/_3 \times \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2} = {}^1/_4$

So the tetrahedron is $\mathbf{^1/_4}$ of the total volume