It's not square!

Aim: To check if you were fully paying attention when you were taught how to manipulate the 3D equation of a line

Steps

1. Write down the co-ordinates of a point (x_1,y_1,z_1), where $x_1 \neq y_1 \neq z_1 \neq 0$. Label it A.
2. Write down the co-ordinates of a different point (x_2,y_2,z_2), where $x_2 \neq y_2 \neq z_2 \neq 0$. Label it B.
3. Calculate $|AB|$
4. Find the equation of the line (L_1) going through A and B
5. Find the equation of a perpendicular line (L_2) going through A
6. Find the equation of a perpendicular line (L_3) going through B
7. C is a point on L_2 such that $|AB|=|AC|$
8. D is a point on L_3 such that $|AB|=|BD|$
9. Calculate $|CD|$
10. Find the equation of the line (L_4) going through C and D

Reflection

- Review your answers to steps 9 and 10.
- Use you results to justify whether or not you have created a square.
- Which was the critical step in determining whether you would end up with a square?

Extension

Would it be possible to construct the equations of the edges of an equilateral triangle in 3D space? What limitations might you have to make?