**12A Introduction to 3D Vectors**

1. Find the distance from the origin to the point P(4, 2, 5)
2. Find the distance between the points A(1, 3, 4) and B(8, 6, -5)
3. The coordinates of A and B are (5, 0, 3) and (4, 2, k) respectively. Given that |AB| is 3 units, find the possible values of k

**12B ijk and unit vectors**

1. Consider the points and .
2. Find the position vectors of and in notation.
3. Find the vector as a column vector
4. The vectors and are given as:

and .

1. Find:

i) ii)

b) State, with a reason, whether either of these vectors is parallel to

1. Find the magnitude of

, and hence find , the unit vector in the direction of .

1. Given the vector:

, with magnitude , calculate the angle between the vector and the , , and axes

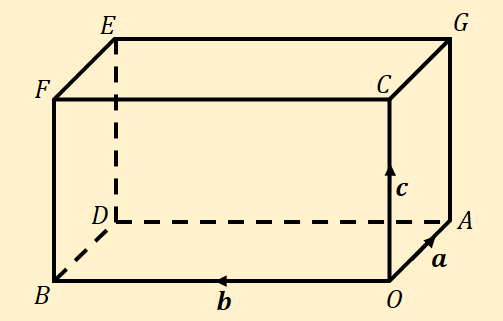
1. The points and have position vectors and relative to a fixed origin O. Find and show that is isosceles.

**12C Modelling with Vectors**

1. , , and are the points , , and respectively.
2. Find and , giving your answers in the form
3. Show that the lines and are parallel and that
4. Hence, describe the quadrilateral
5. , and are the points , and respectively. Find the coordinates of a point such that forms a parallelogram.
6. Given that:

Find the values of , and .

1. The diagram shows a cuboid whose vertices are , , , , , , and . Vectors , and are the position vectors of the vertices , and respectively. Prove that diagonals and bisect each other.



**12D Forces as Vectors**

1. A particle of mass 0.5kg is acted on by 3 forces:
2. Find the resultant force, , that acts on the particle.
3. Find the acceleration of the particle
4. Find the magnitude of the acceleration
5. Given that the particle starts at rest, find the distance travelled in the first 6 seconds of its motion