

Summary 1

12.1

In section 12.1, it explains a 3D space. In order to find a point on a plane, you will need two numbers. They can be represented with (a, b) , hence two dimensional. Although in order to find a point in space, you will need three numbers, hence three dimensional. Coordinate axes are three lines perpendicular to each other and they all pass the origin. This then correlates to coordinate planes. There is the xy plane, yz plane, and xz plane. These planes divide the space into eight parts, called octants.

Summary 1 (Chapter 12)

12.1

In chapter 12 section 1 3D spaces is brought up and is broken down into coordinate axis, coordinate planes, and octants. With these a point will then be able to be found using its coordinates. To explain further, coordinate axes are made up of 3 axes. There is the x -axis, y -axis, and z -axis. These axes are all perpendicular to each other and meet at the O (origin). These axes then make planes called coordinate planes. There is the xz -plane, yz -plane, and xy -plane. Then these planes can be broken down into 8 octants, and octants are the different planes negative or positive. With all this the coordinates to a point can be explained. It is similar to 2 dimensional coordinates but instead of (a,b) it is now (a,b,c) for the 3D coordinates. Where a is the x -coordinate, b is the y -coordinate, and now there is c where it is the z -coordinate.

Summary 1

Section 12.1 The 3D space is a space of three dimensions. Compared to the 2D space, which has 2 coordinate axes, the 3D space has three of them, called the x -axis, y -axis and z -axis. These three axes intersect at the origin (0) and are perpendicular to each other. These coordinate axes give the coordinate planes. The plane containing the x - and y -axes is the xy -plane and the yz -plane and xz -plane. Dividing the space with these 3 planes, we

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SECTION 12.1

WHAT IS 3D SPACE? GEOMETRIC SETTING WHICH THREE PARAMETERS REQUIRED TO DETERMINE POSITION OF POINT.

Diagram illustrating a 3D coordinate system with axes x , y , and z . A point (x, y, z) is shown in the first octant. A line segment connects the origin $(0, 0, 0)$ to the point. A plane is shown containing the x and y axes, labeled "PLANE".

WHAT IS A SURFACE? DEFINED BY EQUATIONS SATISFIED BY POINTS

CYLINDER EQUATION: $\pi r^2 h$

COMPUTE DISTANCE B/W THREE POINTS:

$P_1(x_1, y_1, z_1)$ $P_2(x_2, y_2, z_2)$

$$d(P_1, P_2) = ((x_2 - x_1)^2 + (y_2 - y_1)^2 + (z_2 - z_1)^2)^{1/2}$$

Summary 1

Section 12.1:

- What is the 3D space? (coordinates axis, the coordinate planes, the octants, the coordinates of a point).
 - Coordinates axis: the x-axis, y-axis, and z-axis are called the coordinate axes. These points represent points in space and are all perpendicular to each other.
 - The coordinate planes: The three coordinate axes determine the three coordinate planes. The xy-plane is the plane that contains the x- and y-axes; the yz-plane contains the y- and z-axes; the xz-plane contains the x- and z-axes. These three coordinate planes divide space into eight parts, called octants.

Summary 1

Section 12.1:

- What is the 3D space? (*coordinates axis, the coordinate planes, the octants, the coordinates of a point*)
 - Differing from a 2D plane with coordinates (x,y), a 3D space is set by the coordinates (x,y,z)
 - **Coordinate Axis**: 3 directed lines that are perpendicular to one another that go through a fixed point, O, called the Origin.
 - X axis, y axis, z axis
 - Each coordinate axes determine the 3 **coordinate planes**
 - xy -plane (x and y axes) , yz-plane (y and z axes), xz-plane (x and z axes)

As you can see, most of the students wrote text to explain each concept. Some others used dotted lists to make the presentation more clear. It's up to you. Surprise me, but make sure the presentation of your work stays clear.