**Q1: Find the coordinate of the vertex of parabola**

Solution**:**

To find the vertex of a parabola in the form , we use thevertex formula:

In this case:

a = 4

b = 7

Substitute the values into the formula:

Now, substitute back in the equation to find the y-coordinate of the vertex:

So, the coordinate of the vertex are:

**Q2: Find the distance between points A (1,2,5) and B (3,2,1). Also, find their midpoint.**

Solution:

The distance between two points A(x1,y1,z1) and B(x2, y2, z2) in 3D space is given by:

Substitute A(1,2,5) and B(3,2,1):

Midpoint Formula:

The midpoint M between two points A(x1, y1,z1,) and B(z1,y2,z2) is:

Substitute A(1,2,5) and B(3,2,1)

So, the distance is and the midpoint is (2,2,3).

**Q3: Convert the point from spherical coordinates to rectangular coordinates.**

Solution:

In spherical coordinates:

r = 3

(angles with the z-axis)

(angles with the xy-plane from the x-axis)

The formulas to convert from sphere to rectangular coordinate (x, y, z) are:

Substitute the values:

Thus, the rectangular coordinates are:

**Q4: Check whether the given function is continuous or not at (0,1).**

The function is defined as:

To check continuity at (0,1), we need to determine if

Calculate

1. Approach y = 1 (keeping y = 1 constant):

As

1. Approach

*As*

Since which matches f(0,1), the function is continuous at (0,1).