

12.1
13 Questions

- 3)** Which of the points $A(-4, 0, -1)$, $B(3, 1, -5)$, and $C(2, 4, 6)$, is the closest to the yz -plane? Which point lies in the xz -plane?

5) What does the equation $x = 3$ represent in \mathbb{R}^2 ? What does it represent in \mathbb{R}^3 ? Illustrate with sketches.

7) Describe and sketch the surface in \mathbb{R}^3 , represented by the equation $x + y = 2$.

9) Find the distance between the given points: $(3, 5, -2)$, $(-1, 1, -4)$

11) Find the lengths of the sides of the triangle PQR . Is it a right triangle? Is it an isosceles triangle? $P(3, -2, -3)$, $Q(7, 0, 1)$, $R(1, 2, 1)$

27-39) Describe in words the region of \mathbb{R}^3 represent by the equation(s) or inequalities.

27) $z = -2$

$$29) \qquad y \geq 1$$

$$31) \quad -1 \leq x \leq 2$$

$$33) \quad x^2 + y^2 = 1, z = -1$$

$$35) \qquad y^2 + z^2 \leq 25$$

$$37) \quad x^2 + y^2 + z^2 = 4$$

$$39) \quad 1 \leq x^2 + y^2 + z^2 \leq 5$$

Answers

- 3) C; A
- 5) A line parallel to the y-axis and 4 units to the right of it; a vertical plane parallel to the yz -plane and 4 units in front of it.
- 7) A vertical plane the intersects the xy -plane in the line $y = 2 - x, z = 0$
- 9) 6
- 11) $|PQ| = 6, |QR| = 2\sqrt{10}, |RP| = 6$; isosceles triangle
- 27) A horizontal plane 2 units below the xy -plane
- 29) A half-space consisting of all points on or to the right of the plane $y = 1$
- 31) All points on or between the vertical planes $x = -1$, and $x = 2$
- 33) All points on a circle with radius 2 and center on the z -axis that is contained in the plane $z = -1$
- 35) All points on or inside a circular cylinder of radius 5 with axis the x -axis
- 37) All points on a sphere with radius 2 and center $(0, 0, 0)$
- 39) All points on or between spheres with radii 1 and $\sqrt{5}$ and centers $0, 0, 0$)