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$$|P_1 P_2| = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2 + (z_1 - z_2)^2}$$

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

Distance formula in  $\mathbb{R}^3$ , The distance from

Ex 2: Plot  $y = x + 1$  and  $y = x^2 + 1$

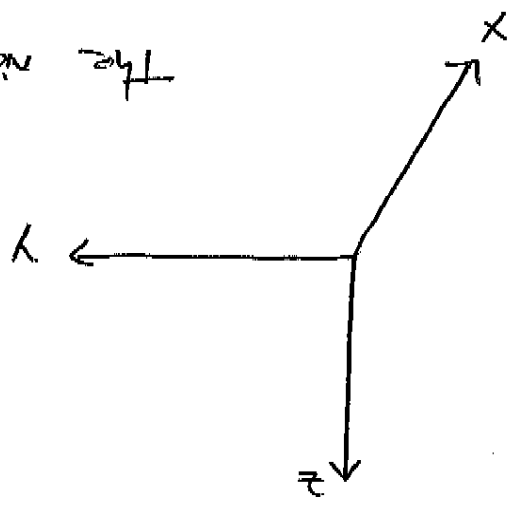
Ex 1: Plot  $x = 4$  and  $z = -2$

$$\mathbb{R}^3 = \{ (x, y, z) \mid x, y, z \in \mathbb{R} \}$$

projections.

Locate coordinates in 3 space.

The right hand rule.



The axes

12.1: 3-D Coordinate Systems.

12.1  
1/2

Ex3: Describe the sphere  $x^2 + y^2 + z^2 \leq 25$  and  $x^2 + y^2 = 1$

Ex4: What is  $x^2 + y^2 + z^2 = 4x - 2y$  (a sphere)?

Find the equation of a sphere w/ radius  $r$  centered at  $(a, b, c)$ .

Ex5: Find the distance from  $A(1, 2, 3)$  to  $B(2, -5, 8)$

12.1
2/2