

MONDAY 22ND SEPTEMBER : 2 AND 3-DIMENSIONAL SPACE

Reading: sections 9.1 and 9.2
Homework: 9.1 Q5, 8, 10, 14, 28, 31, 33

1. TWO-DIMENSIONAL SPACE

- (1) Plot the points $(-2, 1)$ and $(2, 4)$. What is the distance between them? (*Hint: Pythagoras' Theorem*)

- (2) Draw the lines

$$2y + 3x = 7$$

$$y = x + 1$$

Where do they meet?

- (3) Plot all points (x, y) such that

(a) $x^2 + y^2 = 9$

(b) $(x - 1)^2 + (y - 2)^2 = 16$

(c) $x^2 - 4x + y^2 + 6y - 3 = 0$

What points are common to both (a) and (b)?

2. THREE-DIMENSIONAL SPACE

- (1) What formula describes the points (x, y, z) which
- (a) lie on a sphere of radius 2 centered at the origin?
 - (b) lie on a sphere of radius 4 with center $(2, -1, 3)$?
 - (c) lie on or outside a sphere of radius 4 with center $(2, -1, 3)$?

- (2) Plot all points (x, y, z) which satisfy
- (a) $z = 0$
 - (b) $z = 4 + x$
 - (c) $x = y + z$

- (3) Describe the intersection of the sphere

$$(x - 1)^2 + (y - 2)^2 + (z - 3)^2 = 25$$

with the plane $z = 0$

- (a) in words
- (b) using formulae