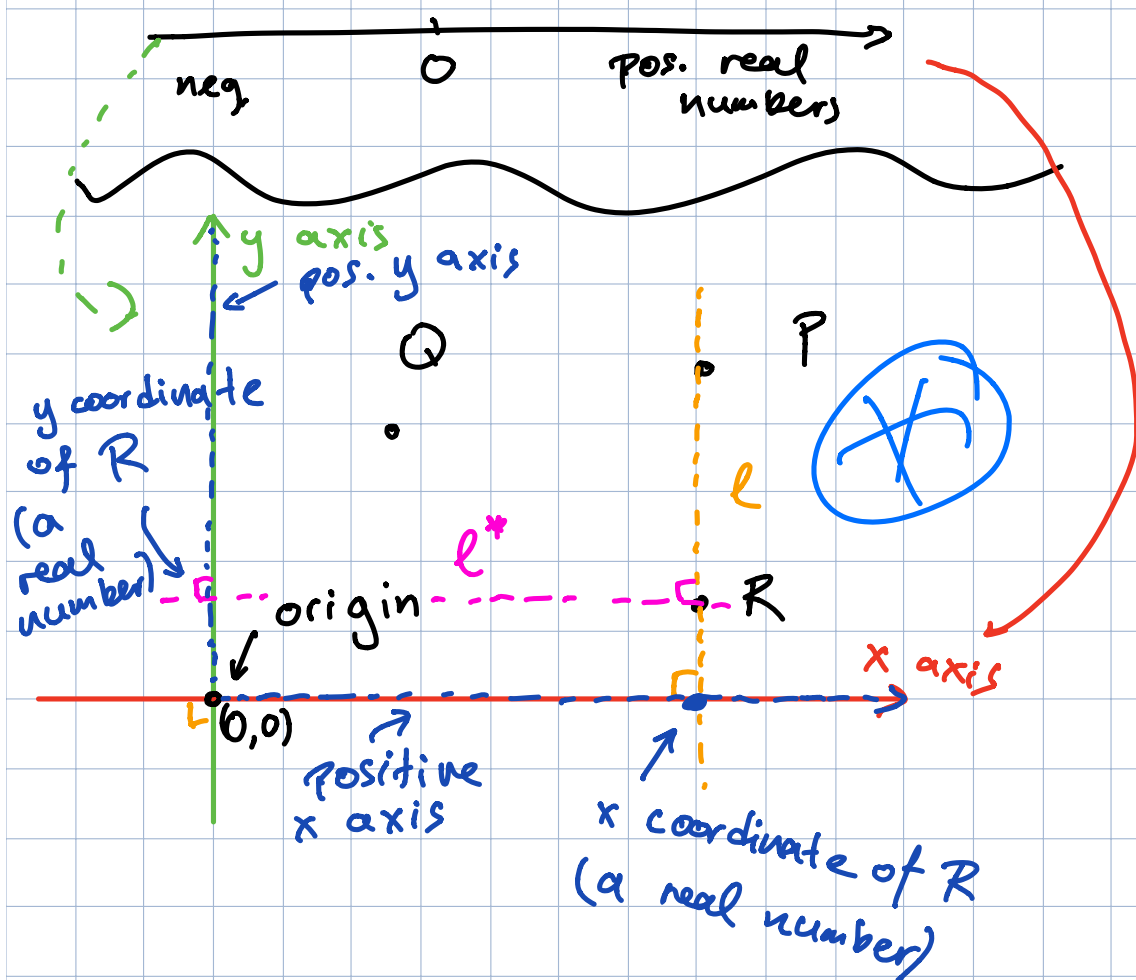
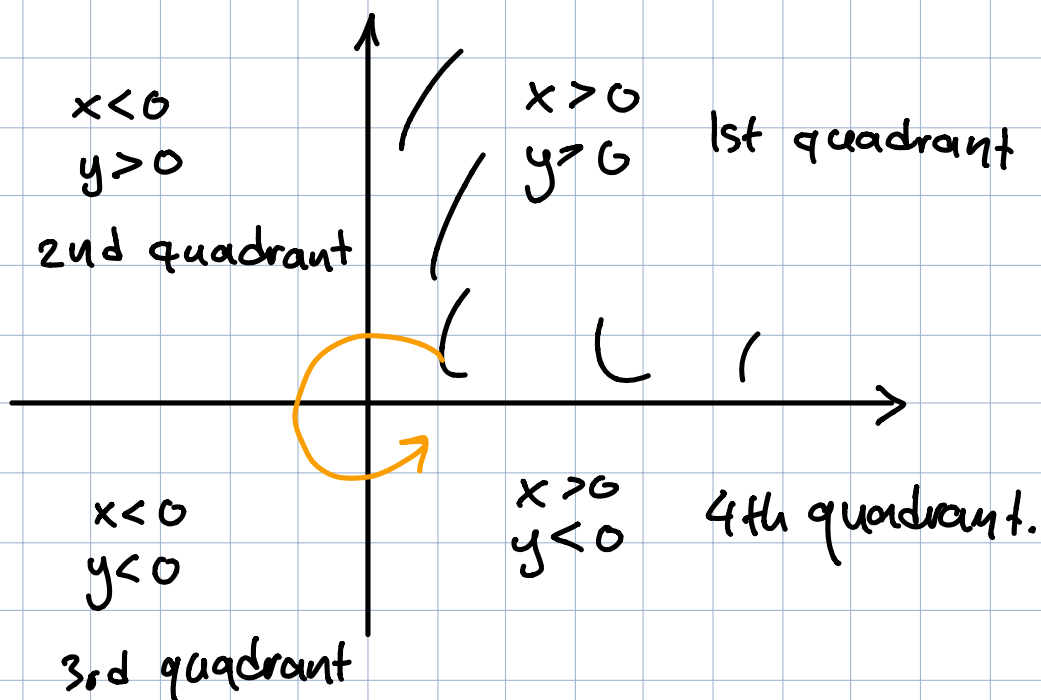


Chapter 2

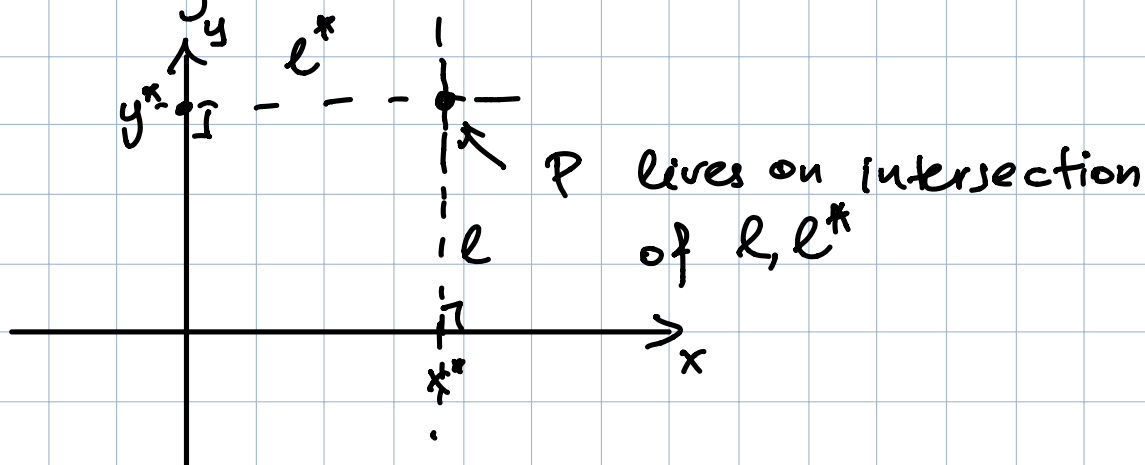
Goal: Find systematic way of assigning a pair of real numbers to points on xy plane.






Each point on xy plane is either in one of 4 quadrants or on one of 2 axes (or both axes, if it's the origin)

We can also go the other way round: from pair (x^*, y^*) of real numbers, we can find a unique point on xy plane.



For each point on xy plane, there is exactly one pair of real numbers.

Ex: In picture , P, R have same x coordinate, different y coordinates.

!! x -axis $\leftrightarrow y=0$
 y -axis $\leftrightarrow x=0$ (x coordinate of all points on y axis is 0)

Pos. y axis : $x=0$
 $y>0$

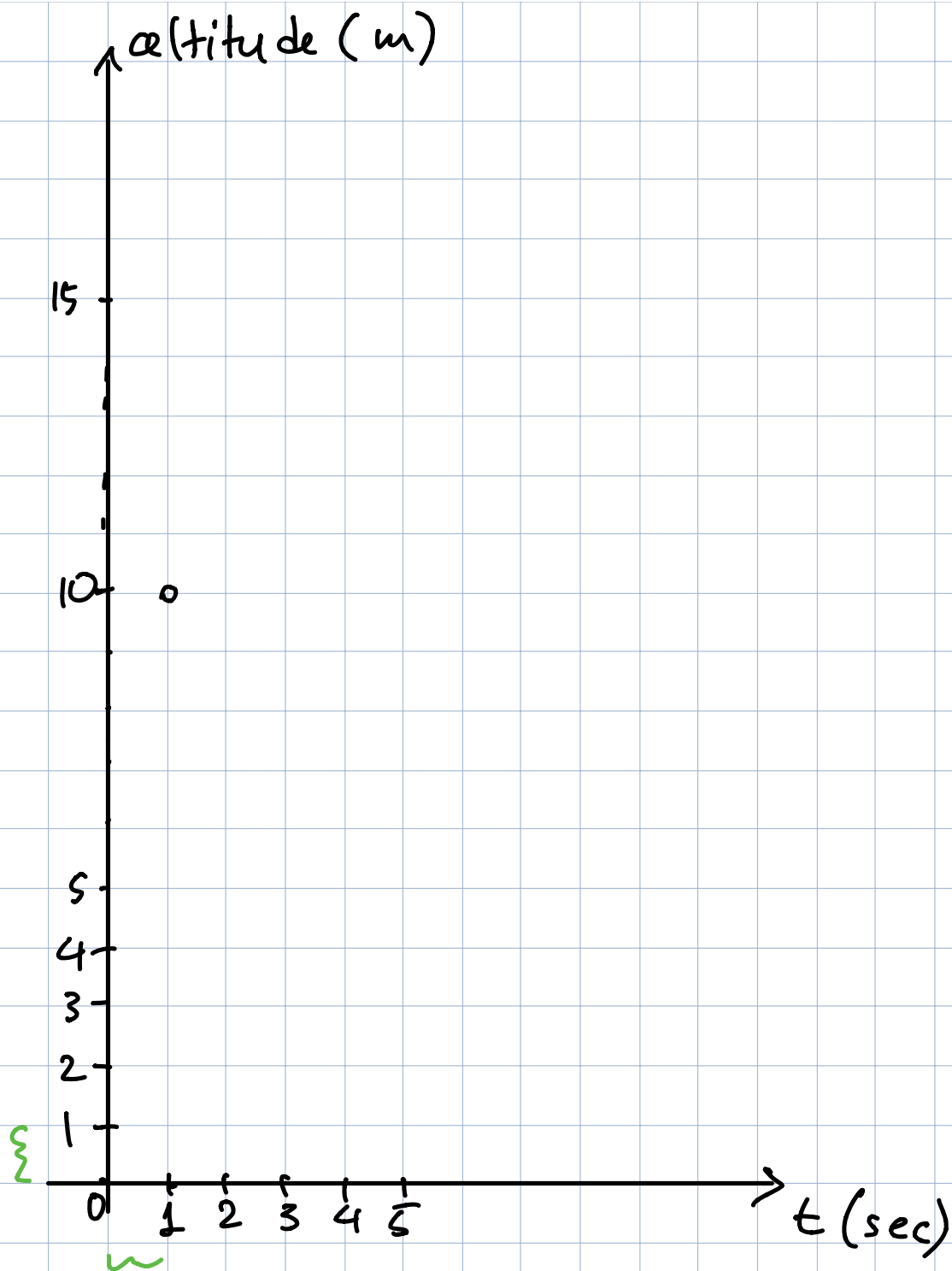
An example

A space rocket has altitude, given in m , t sec after takeoff, that is

$$f(t) = 10t^2$$

Table of values

t	altitude (in m)
$t=1$	10
$t=2$	40
$t=3$	90

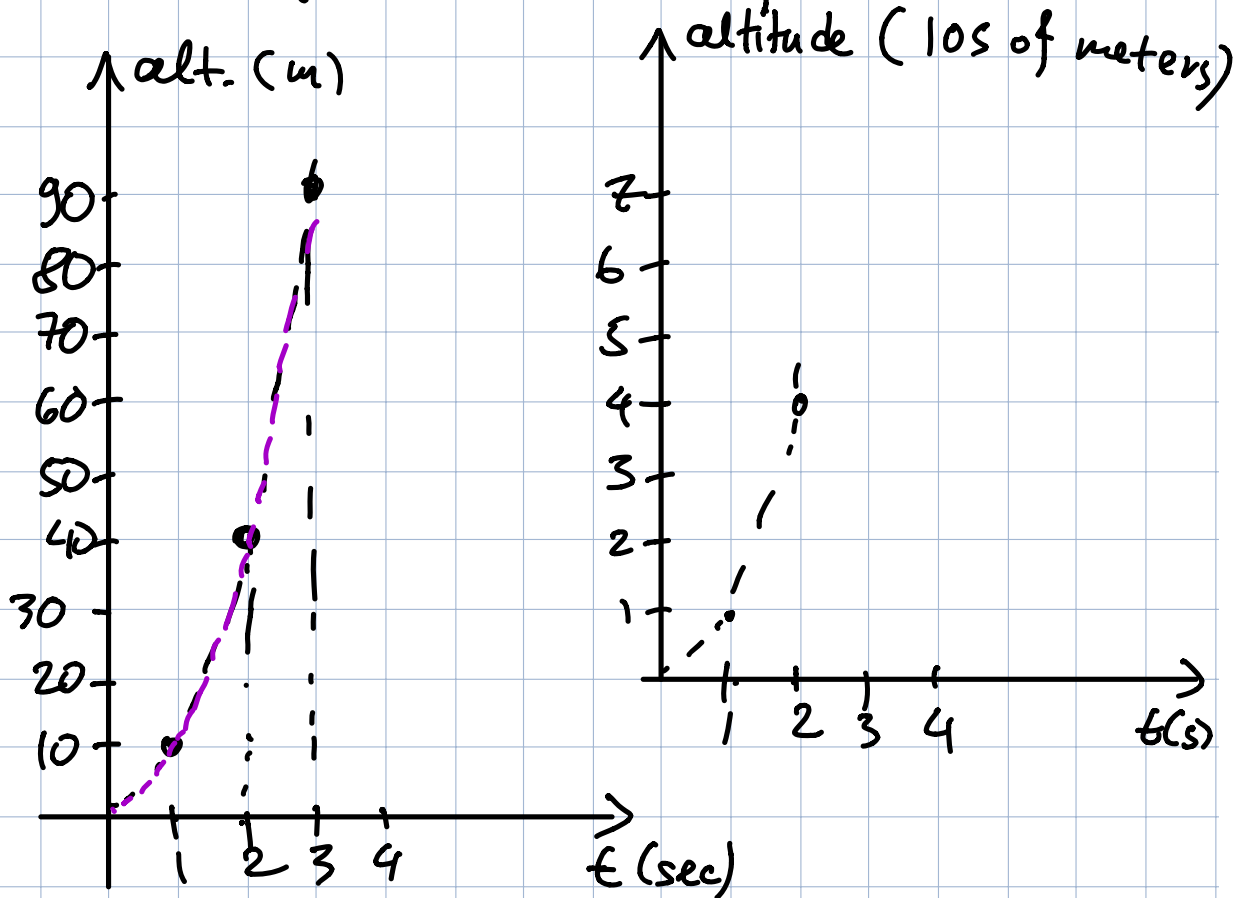


length of a unit in picture is the same for both axes!

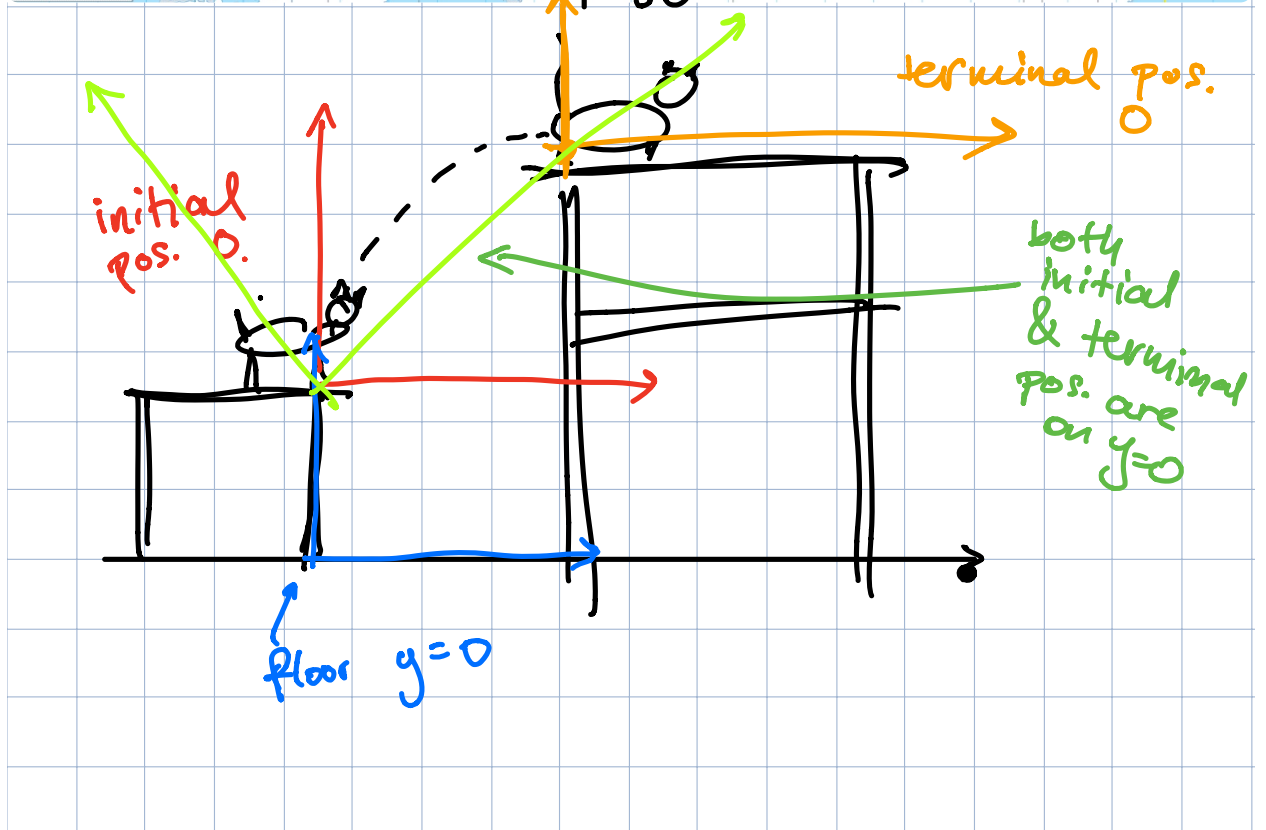
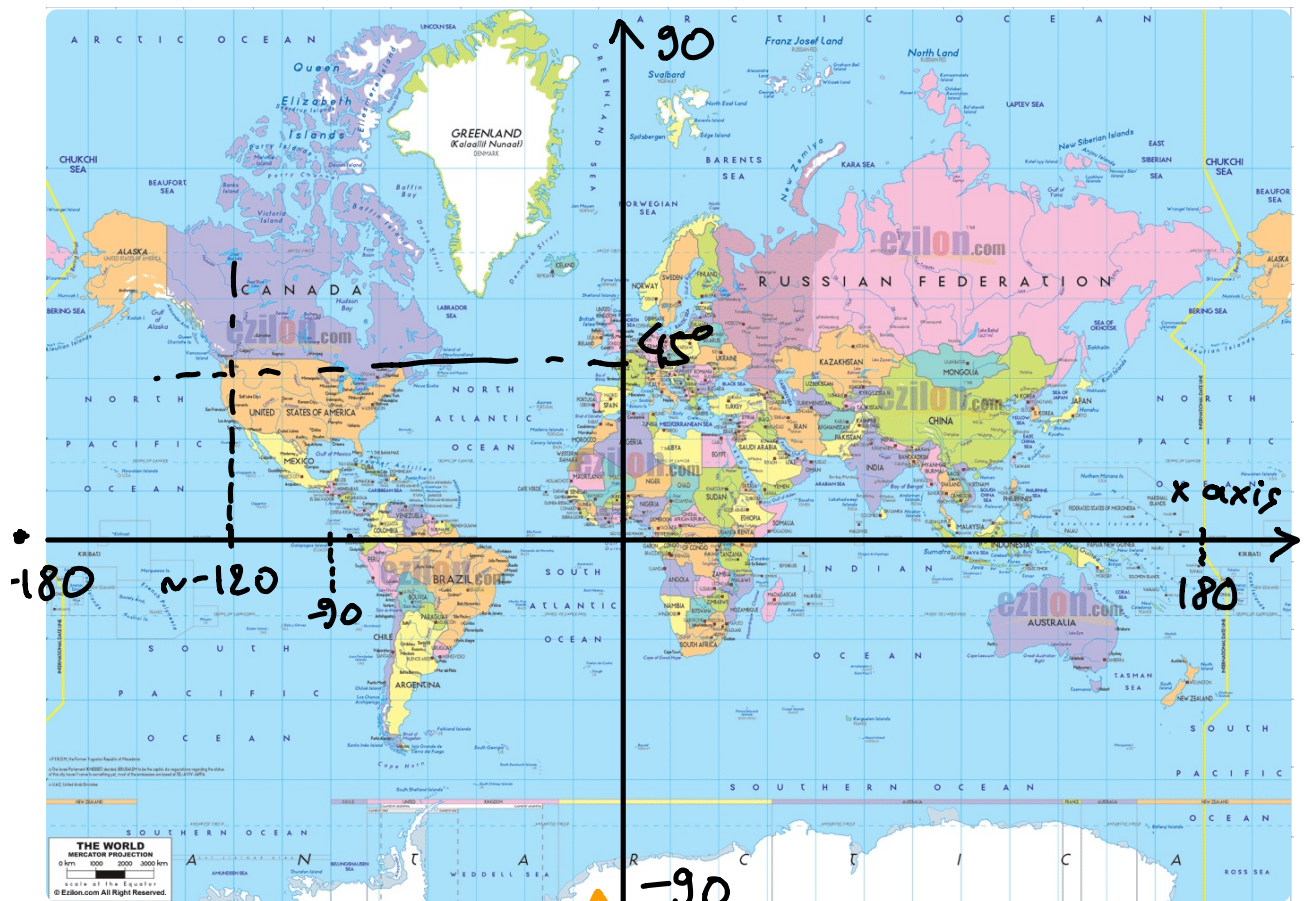
This doesn't work here.

$$\text{Aspect Ratio} = \frac{\text{length of a unit in vertical dir}}{\text{length of a unit in hor. dir.}}$$

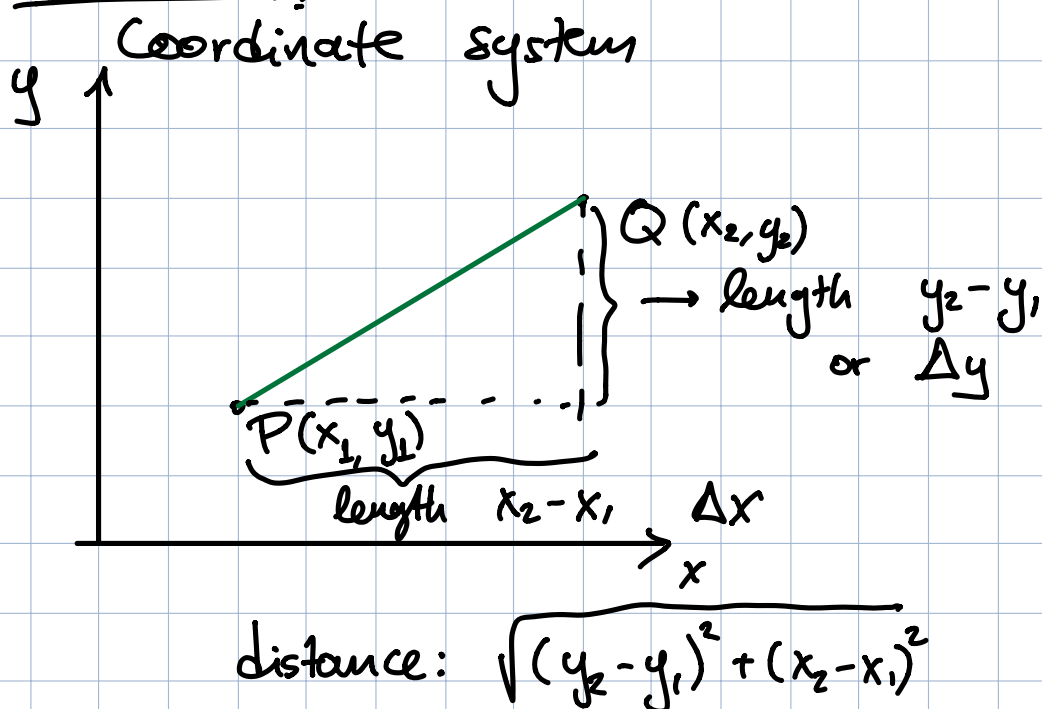
In example above: Aspect Ratio = 1



(This process of changing aspect ratio is called "scaling")



Distance



Ex: A Ferrari is heading south at a constant speed on Broadway. At the same time, a Mercedes is heading west on Aloha ave.

The Ferrari is 624 ft N of the intersection of Broadway & Aloha, at the same time, Mercedes is 400ft east of intersection. If Mercedes is traveling 32 mph, Ferrari at 20 mph:

Find: a) the distance between the 2 cars :

- i) after 1 sec
- ii) after 2 sec
- iii) after 3 sec.

b) Will they collide?