MICROPROCESSOR LAB

Shubham Shrivastava

January 2021

Question 1

Construct the triangles in table:

S.No	Triangle	Given Measurements		
1	△ABC	∠A = 85°	∠B = 115°	AB = 5
2	△PQR	∠Q = 30°	∠R = 60°	QR = 4.7
3	△ABC	∠A = 70°	∠B = 50°	AC = 3
4	△LMN	∠L = 60°	∠N = 120°	LM = 5
5	△ABC	BC = 2	AB = 4	AC = 2
6	△PQR	PQ = 2.5	QR = 4	PR = 3.5
7	△XYZ	XY = 3	YZ = 4	XZ = 5
8	△DEF	DE = 4.5	EF = 5.5	DF = 4

Figure 1: Given

1 Solution

(ii)This traingle can be constructed in following way

Steps of construction:
(i)Draw a line segment PR of length 4.7 cm where P is at (0,0)

(ii)Now, we draw a line from P at an angle of 30° with PR, the line would have the equation as

$$y = \tan(30°)x \tag{1}$$

(iii) Drawing another line from R having an equation

$$y = -tan60° \tag{2}$$

from (i) and (ii), on solving
$\frac{x}{\sqrt{3}}$=-$\sqrt{3}(x-4.7)$
$x = -3x + 3*4.7$
$4x = 14.7$
$x = 3.67$
$putting the value of x in (i), we get$
$y = \frac{3.67}{1.732}$
y=2.12
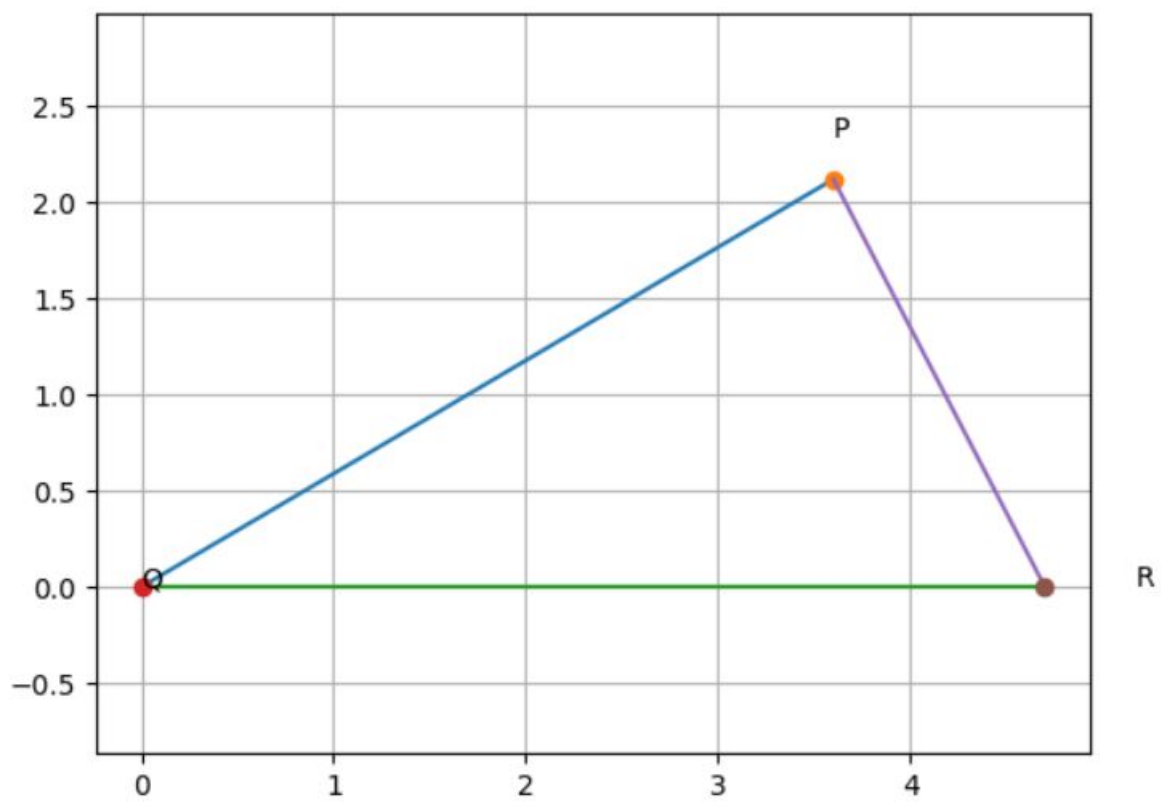Thus Joining **P(3.67,2.12),Q(0,0),R(4.7,0)** we would obtain the required triangle

Figure 2: Python

Solution for (vi)

Given, PQ=2.5cm, QR=4cm, PR=3.5cm

$$p = \frac{a^2 + c^2 - b^2}{2 * a} \tag{3}$$
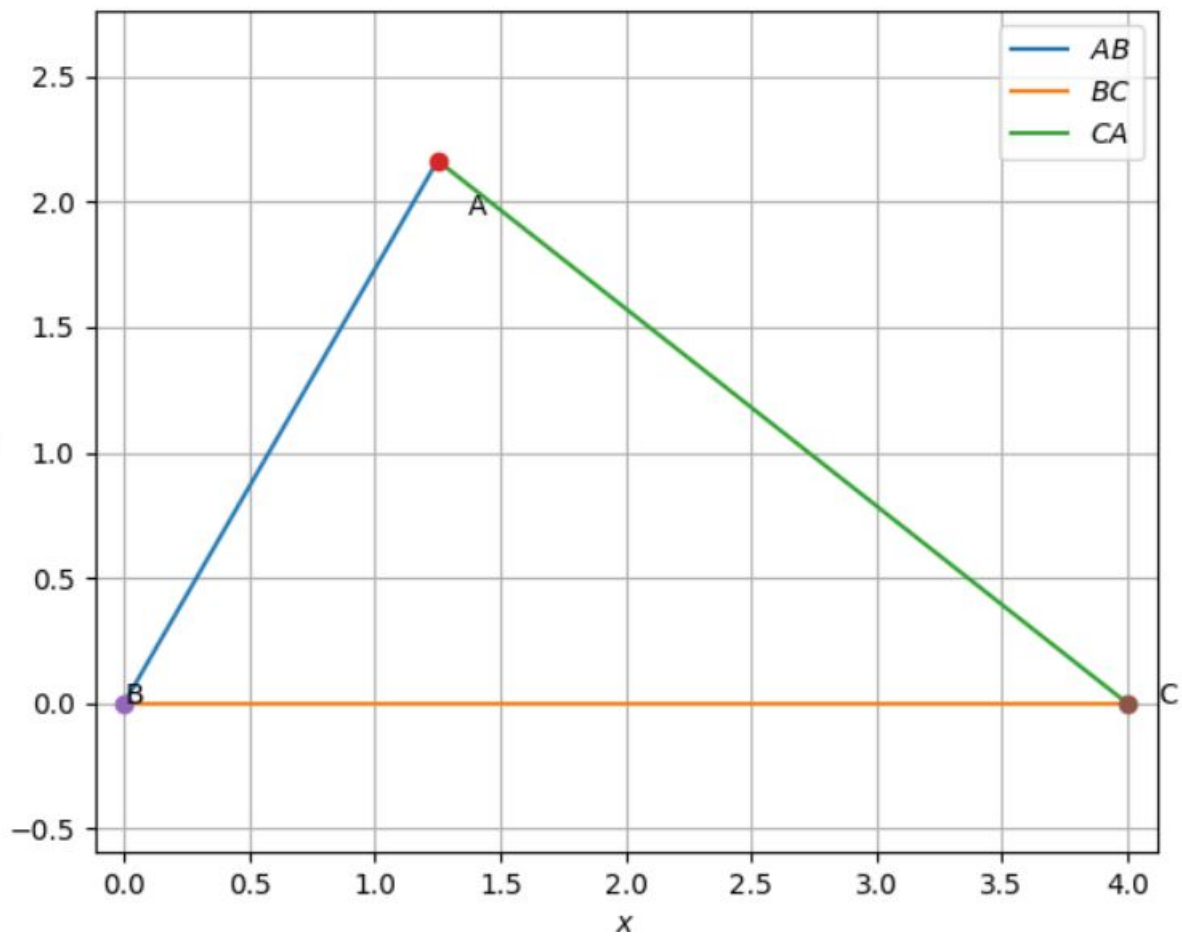
$$q = \sqrt{(c^2 - p^2)} \tag{4}$$

Figure 3: Python

Explaination for other subparts

=>(i)In subpart (i) and (iv) We know that
sum of angles of a triangle = 180°

But here, it doesn't seem so
Since sum of two angles cannot be greater than 180°
therefore, Δ is not possible.

=>(iii)It will be constructed using the same method as we did for subpart (ii)(Δ PQR)

=>subparts (v), (vii),(viii) will be constructed using the same method as we did for subpart (vi)

Question 2

Construct a quadrilateral ABCD such that BC = 4.5, AC = 5.5,CD = 5, BD = 7 and AD = 5.5

Solution

Steps of constructions:
Firstly, we will draw a line AC of 5.5 cm where A is at (0,0)
then, taking A as center with the radius of 5.5 cm we get a circle whose equation is

$$(x)^2 + (y)^2 = (5.5)^2 \tag{5}$$

similarly,by taking C as centre,we get

$$(x - 5.5)^2 + (y - 0)^2 = (5)^2 \tag{6}$$

on solving these two equations, we get a point of intersection which is basically D of our quadrilateral

$$(x - 5.5)^2 + (y - 0)^2 = (5)^2$$
$$x^2 + (5.5)^2 - 11x + y^2 = 25$$
$$(5.5)^2 - y^2 + (5.5)^2 - 11x + y^2 = 25$$
$$x = 3.22$$
putting the value of x in 1
$$y^2 = (5.5)^2 - (3.2)^2$$
$$y = 4.45$$

mark this point as D
Now, join AD and CD
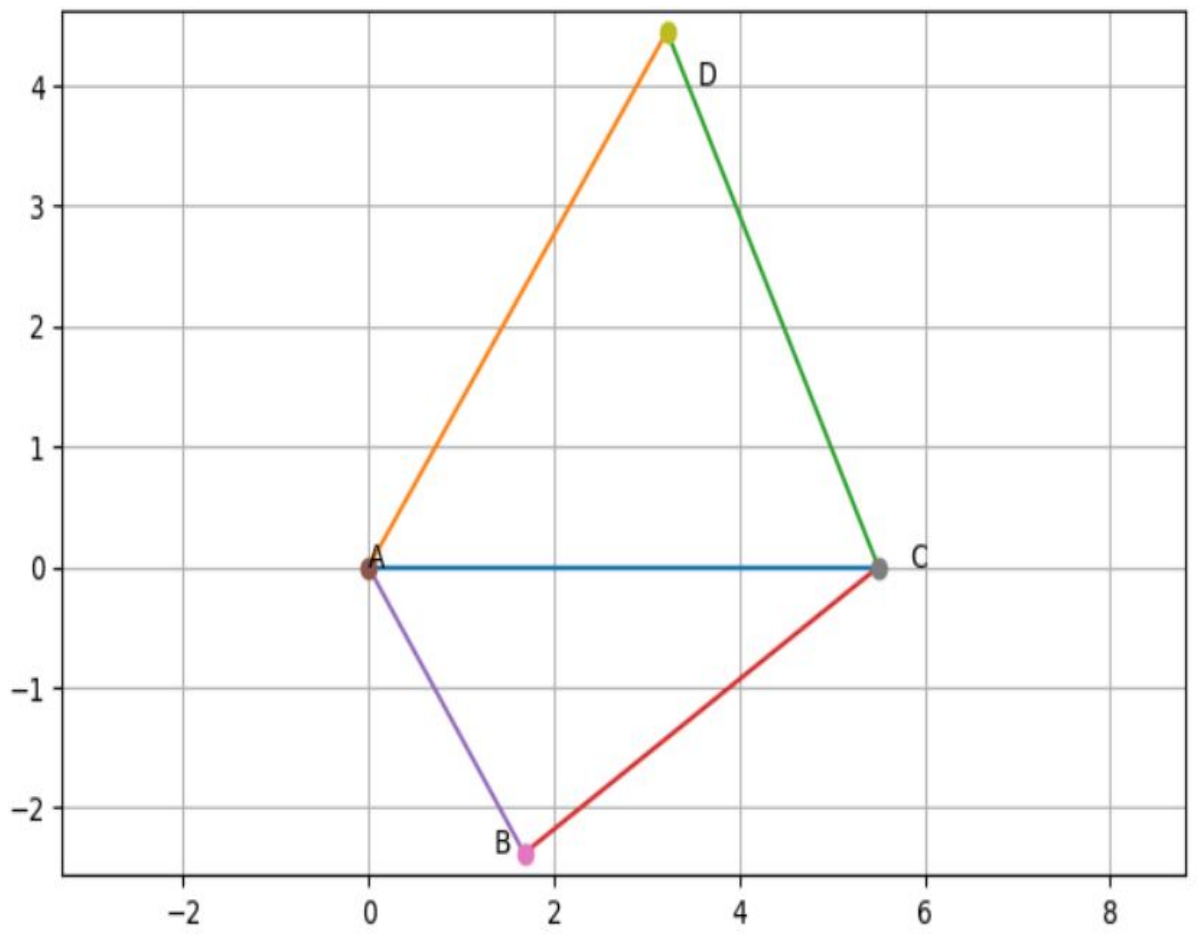then, we further proceed with taking two equations of circle by taking C and D as centers resp.

$$(x - 3.22)^2 + (y - 4.45)^2 = (7)^2 \tag{7}$$

$$(x - 5.5)^2 + (y - 0)^2 = (4.5)^2 \tag{8}$$

on solving, we get
x=1.68 y=-2.37
Mark this point as B and join AB and BC and we would obtain required quadrilateral

ss

Figure 4: Figure generated using python