1

ASSIGNMENT-2

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Download all python codes from

https://github.com/CRAMYATULASI/ ASSIGNMENT-2/tree/main/ASSIGNMENT %202/CODES

and latex-tikz codes from

https://github.com/CRAMYATULASI/ ASSIGNMENT-2/tree/main/ASSIGNMENT %202

1 QUESTION NO-2.34

Draw GOLD such that OL = 7.5, GL = 6, GD = 6, LD = 5 and OD = 10.

2 SOLUTION

Given,

$$OL = 7.5, GL = 6, GD = 6, LD = 50D = 10.$$
 (2.0.1)

Now.

$$OL = ||O - L|| = 7.5$$
 (2.0.2)

$$GL = ||G - L|| = 6$$
 (2.0.3)

$$GD = ||G - D|| = 6 (2.0.4)$$

$$LD = ||L - D|| = 5 (2.0.5)$$

$$OD = ||\mathbf{O} - \mathbf{D}|| = 10 \tag{2.0.6}$$

- 1) We know,a quadrilateral is a polygon with 4 sides if we have four points they will not form a quadrilateral if any three points are collinear.
- 2) Now,let us use the above fact and consider two triangles on same base if any three points are collinear it cannot be a triangle and then given sides cannot form a quadrilateral if any three sides are collinear.
- 3) $\triangle LDO$ and $\triangle LDG$ are two triangles of given quadrialateral which are on same base LD

- 4) Now, we check if any three sides are collinear in two triangles.
- 5) Let us consider $\triangle LDO$ -

$$\|\mathbf{O} - \mathbf{L}\| + \|\mathbf{O} - \mathbf{D}\| = 7.5 + 10 = 17.5 > \|\mathbf{L} - \mathbf{D}\|$$

$$(2.0.7)$$

$$\|\mathbf{O} - \mathbf{D}\| + \|\mathbf{L} - \mathbf{D}\| = 10 + 5 = 15 > \|\mathbf{O} - \mathbf{L}\|$$

$$(2.0.8)$$

$$\|\mathbf{O} - \mathbf{L}\| + \|\mathbf{L} - \mathbf{D}\| = 7.5 + 5 = 12.5 > \|\mathbf{O} - \mathbf{D}\|$$

$$(2.0.9)$$

We observe that no three sides are collinear.

 $\therefore \triangle LDO$ can be constructed.

Similarly, Now we consider $\triangle LDG$

$$\|\mathbf{L} - \mathbf{D}\| + \|\mathbf{G} - \mathbf{L}\| = 5 + 6 = 11 > \|\mathbf{G} - \mathbf{D}\|$$
(2.0.10)

$$\|\mathbf{G} - \mathbf{L}\| + \|\mathbf{G} - \mathbf{D}\| = 6 + 6 = 12 > \|\mathbf{L} - \mathbf{D}\|$$
(2.0.11)

$$\|\mathbf{L} - \mathbf{D}\| + \|\mathbf{G} - \mathbf{D}\| = 5 + 6 = 11 > \|\mathbf{G} - \mathbf{L}\|$$
(2.0.12)

We observe that no three sides are collinear.

- $\therefore \triangle LDG$ can be constructed.
- :. Given sides form a quadrilateral.

Plot of the quadrilateral GOLD:

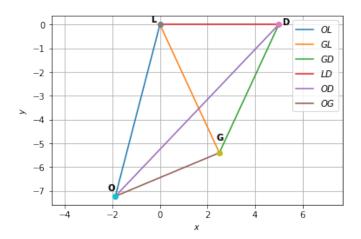


Fig. 2.1: Quadrilateral GOLD