

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,

$$OL = 7.5, GL = 6, GD = 6, LD = 5, OD = 10. \quad (2.0.1)$$

Now,

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

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

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

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

$$OD = \|O - D\| = 10 \quad (2.0.6)$$

- 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 quadrilateral which are on same base LD

4) Now, we check if any three sides are collinear in two triangles.

5) Let us consider $\triangle LDO$ -

$$\|O - L\| + \|O - D\| = 7.5 + 10 = 17.5 > \|L - D\| \quad (2.0.7)$$

$$\|O - D\| + \|L - D\| = 10 + 5 = 15 > \|O - L\| \quad (2.0.8)$$

$$\|O - L\| + \|L - D\| = 7.5 + 5 = 12.5 > \|O - D\| \quad (2.0.9)$$

We observe that no three sides are collinear.

$\therefore \triangle LDO$ can be constructed.

Similarly, Now we consider $\triangle LDG$

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

$$\|G - L\| + \|G - D\| = 6 + 6 = 12 > \|L - D\| \quad (2.0.11)$$

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

We observe that no three sides are collinear.

$\therefore \triangle LDG$ can be constructed.

\therefore Given sides form a quadrilateral.

Plot of the quadrilateral GOLD :



Fig. 2.1: Quadrilateral GOLD