# Assignment-2

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Download all python codes from

https://github.com/satyasm45/Summer−Internship/tree/main/Assignment−2/Codes

and latex-tikz codes from

https://github.com/satyasm45/Summer−Internship/tree/main/Assignment−2/Figs

## 1 Question No. 2.28

Construct a quadrilateral ABCD such that AB =5, $\angle A = 50^\circ$ , AC = 4, BD = 5 and AD = 6.

## 2 Explanation

The rough figure of the expected quadrilateral ABCD is given in Figure 2.1.

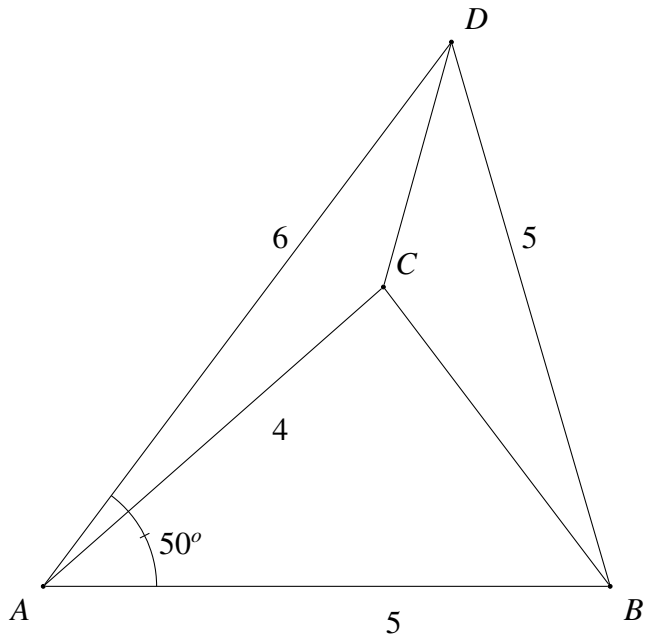


Fig. 2.1: Rough Figure

For this quadrilateral adjacent side lengths AB,AD and diagonal BD is known. Three sides of $\triangle ABD$ are therefore known.

So, $\angle A$ can also be found out using the Cosine Rule. But value for $\angle A$ is given. So we need to verify it.

$$\cos A = \frac{\|\mathbf{B}-\mathbf{A}\|^2 + \|\mathbf{D}-\mathbf{A}\|^2 - \|\mathbf{D}-\mathbf{B}\|^2}{2 \times \|\mathbf{B}-\mathbf{A}\| \times \|\mathbf{D}-\mathbf{A}\|} \tag{2.0.1}$$

$$\cos A = \frac{5^2 + 6^2 - 5^2}{2 \times 5 \times 6} \tag{2.0.2}$$

$$\implies \angle A = \cos^{-1}(0.6) \tag{2.0.3}$$

So $\angle A = 53.13^\circ$.

But $\angle A = 50^\circ$ is given which causes a mismatch.

Therefore construction of quadrilateral with given measurements is not possible.