Assignment 2

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***Abstract*—This document contains the solution to find the lengths of the straight line joining the pairs of points whose polar coordinates are given .**

Download all python codes from

https://github.com/vishu1302/Introduction_to_AI-ML.git/Assignment_1.ipynb

Download latex-tikz codes from

https://github.com/vishu1302/Introduction_to_AI-ML.git/main.tex

1 Problem

Solve: Problem set: Vector2, Example-3,14

Find the lengths of the straight lines joining the pairs of points whose polar coordinates are:

$$\mathbf{P} = \begin{pmatrix} a \\ \frac{\pi}{2} \end{pmatrix} \text{ and } \mathbf{Q} = \begin{pmatrix} 3a \\ \frac{\pi}{6} \end{pmatrix}$$

2 Solution

Let P and Q be the two points and let their polar coordinates be

$$\mathbf{P} = \begin{pmatrix} a \\ \frac{\pi}{2} \end{pmatrix} \text{ and } \mathbf{Q} = \begin{pmatrix} 3a \\ \frac{\pi}{6} \end{pmatrix}$$

so that ,

$$OP = r_1 OQ = r_2$$

and angles respectively be

$$\theta_1 and \theta_2$$

$$PQ^2 = OP^2 + OQ^2 - 2 * OP * OQ * cos(POQ) \quad (2.0.1)$$

$$length = r_1^2 + r_2^2 - 2 * r_1 * r_2 * cos(\theta_1 - \theta_2) \quad (2.0.2)$$