Tutorial 1: PHY101

(MONSOON 2024)

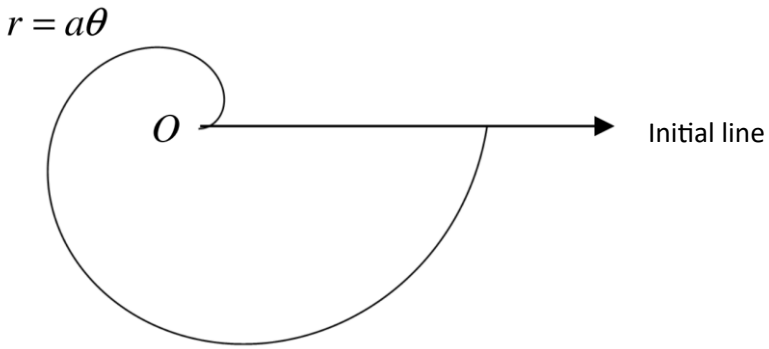
1) Use the method of dimensions to obtain the form of the dependance of the lift force per unit wingspan on an aircraft wing of width (in the direction of motion) L, moving with velocity v through the air density ρ, on the parameters L, v, ρ.

2) The figure below shows a spiral curve with the polar equation.

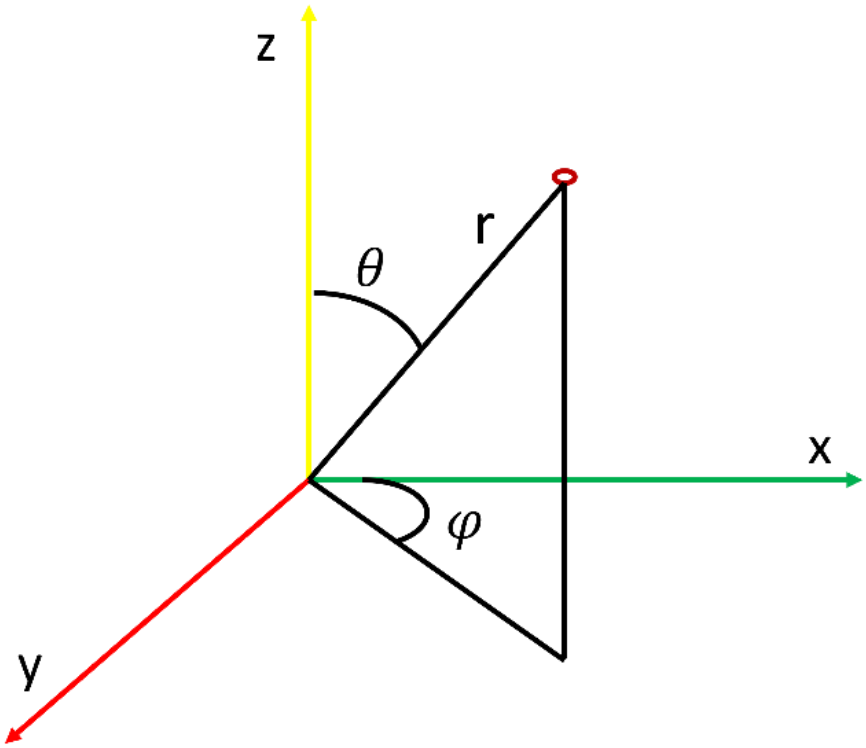
$$r = a\,\theta\,, \qquad 0 \leq \theta \leq 2\pi$$

where a is **a** positive constant.

Find the area of the finite region bounded by the spiral and the initial line.



3) Represent the spherical coordinate location B (4, π/3, π/6) in rectangular coordinate system. Locate the point on the figure.



4) Convert (-1, -1) into polar coordinates.