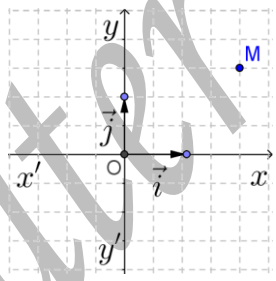
❖ ***Cartesian Coordinates:***

Let $M(x_M; y_M)$ be any point in the orthonormal system $\left(O; \vec{i}, \vec{j}\right)$, where $\left\|\overrightarrow{OM}\right\| = \rho$ and $\left(\vec{i}, \overrightarrow{OM}\right) = \theta[2\pi]$.



1) Determine ρ in terms of coordinates of M. ……..
2) Find: $\cos\theta$.....; $\sin\theta$.....
3) Write $\overrightarrow{OM}$ in analytic form using ρ & θ: ……

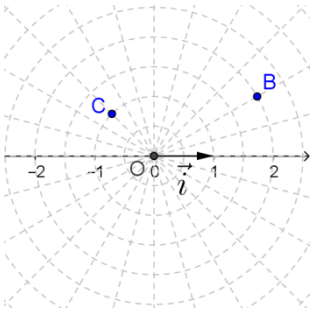
❖ ***Polar Coordinates:***

Consider the point M defined by its polar coordinates $[\rho;\theta]$, where $\rho = \left\|\overrightarrow{OM}\right\|$ and $\theta = \left(\vec{i}; \overrightarrow{OM}\right)$.

Ex: Consider the points B & C on the adjacent polar system:

a. What are the polar coordinates of the points B & C?
……

b. Plot the point $D\left[2, -\frac{\pi}{12}\right]$ on the same system.



Ex: Consider in the orthonormal system $\left(O; \vec{i}, \vec{j}\right)$ the points E & F of respective polar coordinates $\left[2; \frac{\pi}{6}\right]$ & $\left[3; \frac{2\pi}{3}\right]$.

1) Can you expect to which quadrant does each point belong? Justify.
……
2) Determine the Cartesian coordinates of the points E & F.
…… ……
…… ……
…… ……
…… ……
3) Find the nature of the triangle OEF.
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……
……
4) Deduce the measure of $[EF]$.
……
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