

7.3.3

EE24BTECH11058 - P.Shiny Diavajna

Question:The equation of a circle with origin as centre and passing through the vertices of an equilateral triangle whose median is of length $3a$ is

Solution:

Symbol	Value	Description
O	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	Centre of the circle
$3a$	-	median of the triangle
r	$2a$	radius of the circumcircle
u	$\begin{pmatrix} 0 \\ 0 \end{pmatrix}$	$-O$
f	-	$\ u\ ^2 - r^2$

TABLE 0: Variables Used

The general equation of a circle (0.1)

$$\|x\|^2 + u^T x + f = 0 \quad (0.2)$$

$$u = \begin{pmatrix} 0 \\ 0 \end{pmatrix} \quad (0.3)$$

$$r = 2a \quad (0.4)$$

$$f = \|u\|^2 - r^2 \quad (0.5)$$

$$f = -4a^2 \quad (0.6)$$

$$\|x\|^2 - 4a^2 = 0 \quad (0.7)$$

$$x^2 + y^2 = 4a^2 \quad (0.8)$$

$$(0.9)$$

