

MAT 116E Advanced Scientific and Engineering Computing

Lab-11 / CRN : 12852

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1 Question 1

a.) Let us consider following 3x3 matrix.

$$A = \begin{bmatrix} 0 & 1 & 3 \\ 2 & x & 4 \\ y & 1 & 7 \end{bmatrix}$$

Find the (x, y) pairs that makes determinant of A is zero in the interval $x = (-5, 1)$ with increment of 0.1 and sketch these points on xy -plane.

b.) Let $f(x) = \sin(\cos(x))$. Find the $f'(x)$ by using limit definition of the derivative and compare your result by using **diff** command. Print a simple message on the screen.

$$f'(x) = \lim_{h \rightarrow 0} \frac{f(x+h) - f(x)}{h}$$

2 Question 2

A ceramic tile has the design shown in the figure. The shaded area is painted red and the rest of tile is white. The border line between the red and the white areas follows the equation $y = -kx^2 + 12kx$. Determine k such that the areas of the white and the red colors will be the same.

