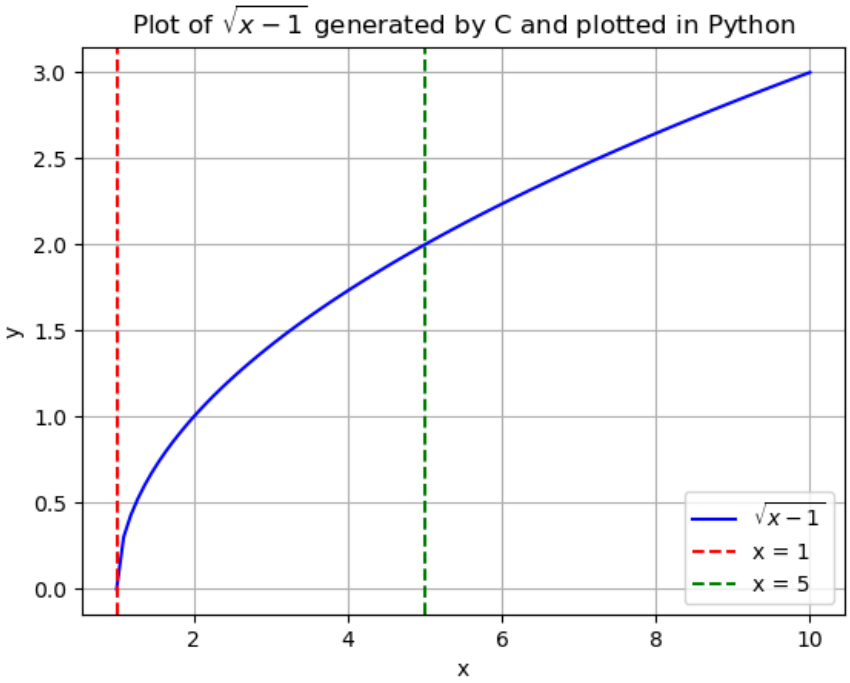
ASSIGNMENT 3

EE24BTECH11031 - Jashwanth

Question: Draw a rough sketch of the curve $y = \sqrt{x-1}$ in the interval $[1,5]$. Find the area under the curve and between the lines $x = 1$ and $x = 5$.

Solution: As the graph is always above x-axis, the area(A) is



$$A = \int_1^5 \sqrt{x-1}\,dx \tag{1}$$

$$A = \left[\frac{2}{3}(x-1)^{\frac{3}{2}}\right]_1^5 \tag{2}$$

$$A = \left(\frac{2}{3}(5-1)^{\frac{3}{2}}\right) - \left(\frac{2}{3}(1-1)^{\frac{3}{2}}\right) \tag{3}$$

$$A = \left(\frac{2}{3}\times 8\right) - \left(\frac{2}{3}\times 0\right) \tag{4}$$

$$A = \frac{16}{3} \tag{5}$$

$$\tag{6}$$

Area under the graph is $\frac{16}{3}$.