

9-9.2-38

AI24BTECH11002 - K.AKSHAY TEJA

Question:

Find the area bounded by the curve $y = x|x|$, x -axis and the ordinates $x = -1$ and $x = 1$.

Solution:

Range	Equation of conic
$x \geq 0$	$y = x^2$
$x < 0$	$y = -x^2$

TABLE 0: Information

For $x \geq 0$, the equation of the curve is given by

$$y = x^2 \quad (0.1)$$

For $x < 0$, the equation of the curve is given by

$$y = -x^2 \quad (0.2)$$

As you can see in the figure, the area bounded by the curve $y = x|x|$ in between the lines $x = -1$ and $x = 1$ is given by

$$\left| \int_{-1}^0 -x^2 dx \right| + \left| \int_0^1 x^2 dx \right| = \frac{2}{3} \quad (0.3)$$

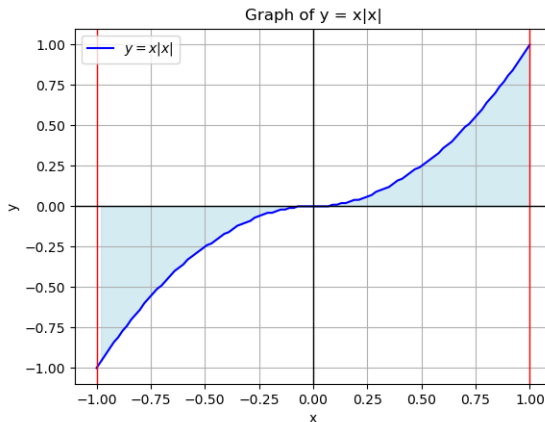


Fig. 0.1: Graph of $y = x|x|$