

Q1].. Consider the following function

$$f(x) = \sqrt{25 - x^2}$$

Write down the domain and the range of  $f$ .

$$\begin{aligned} \text{Domain of } f &= \text{all } x \text{ satisfying } 25 - x^2 \geq 0 \\ &= \text{all } x \text{ satisfying } x^2 \leq 25 \\ &= \text{all } x \text{ satisfying } -5 \leq x \leq 5 \\ &= [-5, 5] \end{aligned}$$

$$\begin{aligned} \text{Range of } f &= \text{all outputs from } 0 \text{ (when } x=5) \text{ through } 5 \text{ (when } x=0) \\ &= [0, 5] \end{aligned}$$

Sketch the graph of the function  $f$ .

$$y = \sqrt{25 - x^2}$$

$$y^2 = 25 - x^2$$

$$x^2 + y^2 = 25$$

Circle of radius 5  
centered on (0,0)

$\Rightarrow y = \sqrt{25 - x^2}$   
is upper  $\frac{1}{2}$ -circle

