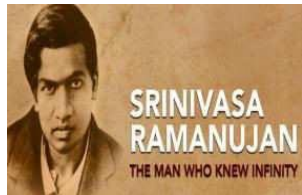
		SRM Institute of Science and Technology Kattankulathur	
		DEPARTMENT OF MATHEMATICS	
		18MAB101T Calculus and Linear Algebra	
		UNIT - IV	
		Tutorial Sheet -1	Answers
1.	Find the radius of the curve $y = e^x$ at $(0, 1)$	$\rho = 2\sqrt{2}$	
2.	Find the radius of curvature at the point $\left(\frac{1}{4}, \frac{1}{4}\right)$ on the curve $\sqrt{x} + \sqrt{y} = 1$.	$\rho = 1/\sqrt{2}$	
3.	Show that the radius of curvature at any point of the catenary $y = c \cosh(x/c)$ is y^2/c . Also find ρ at $(0, c)$.	$\rho = C$	
4.	Find the radius of curvature at the point (c, c) on the curve $xy = c^2$	$\rho = c\sqrt{2}$	
5.	Find ρ at any point $P(at^2, 2at)$ on the parabola $y^2 = 4ax$.	$\rho = 2a(1+t^2)^{3/2}$	
6.	Find the radius of curvature at any point $x = a \cos^3 \theta, y = a \sin^3 \theta$ of the curve $x^{2/3} + y^{2/3} = a^{2/3}$. Also show that $\rho^3 = 27axy$.	$\rho = 3a \sin 2\theta / 2$	
7.	Show that the radius of curvature at any point of the curve $x = ae^\theta (\sin \theta - \cos \theta), y = ae^\theta (\sin \theta + \cos \theta)$ is twice the perpendicular distance of the tangent at the point from the origin.		
8.	Prove that the radius of curvature at any point of the cycloid $x = a(\theta + \sin \theta), y = a(1 - \cos \theta)$ is $4a \cos \frac{\theta}{2}$.		
9.	Show that the line joining any point θ on $x = a(\theta + \sin \theta), y = a(1 - \cos \theta)$ to its centre of curvature is bisected by the line $y = 2a$.		
10.	Find the circle of curvature of the curve $\sqrt{x} + \sqrt{y} = \sqrt{a}$ at the point $\left(\frac{a}{4}, \frac{a}{4}\right)$.	$(x - \frac{3a}{4})^2 + (y - \frac{3a}{4})^2 = \frac{a^2}{2}$	