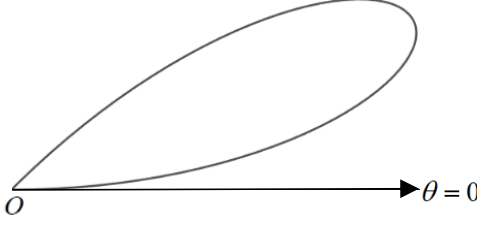


6(a)	
	$\theta = \frac{1}{6}\pi.$
6(b)	$\frac{1}{2} \int_0^{\frac{1}{3}\pi} \sin^2 3\theta \, d\theta$ $= \frac{1}{4} \int_0^{\frac{1}{3}\pi} 1 - \cos 6\theta \, d\theta = \frac{1}{4} \left[\theta - \frac{1}{6} \sin 6\theta \right]_0^{\frac{1}{3}\pi}$ $= \frac{1}{12} \pi$
6(c)	$y = 3 \sin^2 \theta - 4 \sin^4 \theta$ $6 \sin \theta \cos \theta - 16 \sin^3 \theta \cos \theta = 0$ $\sin \theta \cos \theta \neq 0 \Rightarrow 6 - 16 \sin^2 \theta = 0$ $\sin^2 \theta = \frac{3}{8}$ $y = \frac{9}{16}.$
6(d)	$r^4 = r \sin \theta (3r^2 - 4r^2 \sin^2 \theta)$ $r = \frac{3y}{r} - 4 \frac{y^3}{r^3}$ $(x^2 + y^2)^2 = y(3x^2 - y^2)$