Lab quiz 12

$\sin 3\theta = 0$

$3\theta = 0, \pi$

$\theta = 0, \frac{\pi}{3}$

1. The area of one petal of $r(\theta) = sin(3\theta)$ can be given by:

I. $\int_0^{\frac{\pi}{6}} (sin(3\theta))^2 d\theta$

II. $\int_0^{\frac{\pi}{3}} (sin(3\theta))^2 d\theta$

III. $\int_0^{\frac{\pi}{3}} \frac{1}{2}(sin(3\theta))^2 d\theta$

IV. $\int_{\frac{\pi}{3}}^{\frac{\pi}{2}} (sin(3\theta))^2 d\theta$

(A) I only

(B) II only

(C) III only

(D) I, II and IV only

(E) I, III and IV only

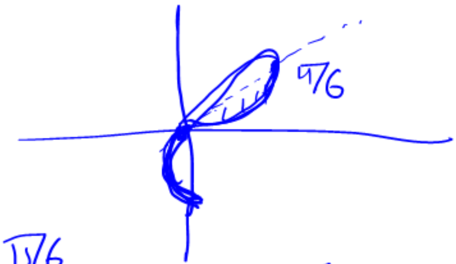
(F) I,II,III and IV

$\theta = \frac{\pi}{6}$

$\sin(\frac{3\pi}{6})$

$\sin(\frac{\pi}{2})$

1



$\theta = \frac{\pi}{2}$

$\sin(\frac{3\pi}{2})$

-1

$\cancel{2}\int_0^{\pi/6} \frac{1}{\cancel{2}} (\sin 3\theta)^2 d\theta$

$\int_0^{\pi/3} \frac{1}{2} (\sin 3\theta)^2 d\theta$

$\cancel{2}\int_{\pi/3}^{2\pi/2} \frac{1}{\cancel{2}} (\sin 3\theta)^2 d\theta$

total # of petals = 12

2. The area of all petals of $r(\theta) = sin(6\theta)$ can be given by $\int_0^{\frac{\pi}{3}} 3(sin(6\theta))^2 d\theta$

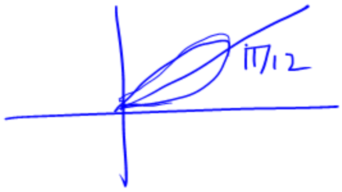
(A) True

(B) False

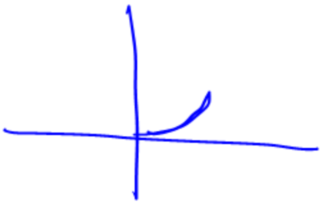
$\sin 6\theta = 0$

$6\theta = 0, \pi$

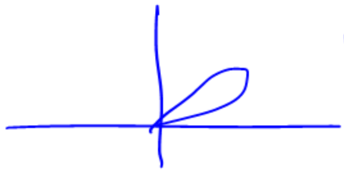
$\theta = 0, \frac{\pi}{6}$



$0 \le \theta \le \pi/12$

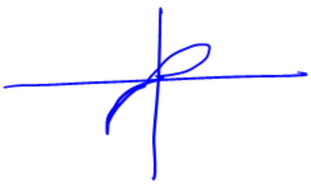


$0 \le \theta \le \pi/6$

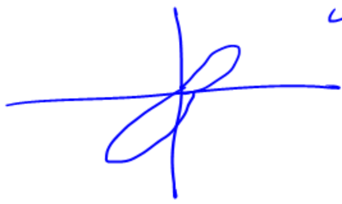


$\cancel{12}\,4 \int_0^{\pi/6} \frac{1}{2} (\sin 6\theta)^2 d\theta$

$0 \le \theta \le \pi/4$



$0 \le \theta \le \pi/3$



$3\cancel{6} \int_0^{\pi/3} \frac{1}{2} (\sin 6\theta)^2 d\theta$

3. The definite integral(s) which gives the area bounded by the inner loop of $r(\theta) = 1 - 2sin\theta$ is (are):

$1 - 2\sin\theta = 0$

$\sin\theta = \frac{1}{2}$

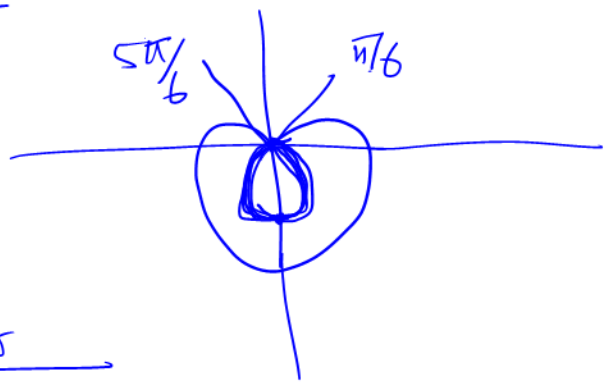
$\theta = \frac{\pi}{6}$

$\theta = \frac{5\pi}{6}$

I. $\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \frac{1}{2}(1 - 2sin\theta)^2 d\theta$

II. $\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} (1 - 2sin\theta)^2 d\theta$

III. $\int_{\frac{\pi}{2}}^{\frac{5\pi}{6}} (1 - 2sin\theta)^2 d\theta$



(A) I only

(B) II only

(C) III only

(D) I and II only

(E) I and III only

(F) I, II and III

θ	r
0	1
$\frac{\pi}{6}$	0
$\frac{\pi}{2}$	-1

$\cancel{2}\int_{\frac{\pi}{6}}^{\frac{\pi}{2}} \frac{1}{\cancel{2}}(1-2\sin\theta)^2 d\theta$

$\int_{\frac{\pi}{6}}^{\frac{5\pi}{6}} \frac{1}{2}(1-2\sin\theta)^2 d\theta$

4. The definite integrals which gives the area bounded by the inner loop of $r(\theta) = 1 - 2cos\theta$ are:

I. $\int_{\frac{\pi}{3}}^{\frac{5\pi}{3}} \frac{1}{2}(1-2cos\theta)^2 d\theta$

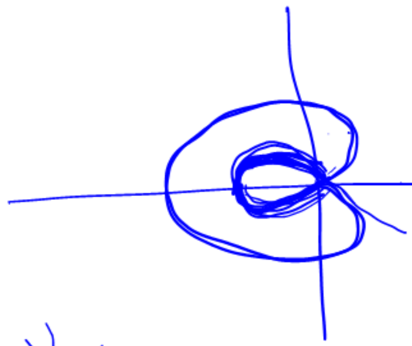
II. $\int_{\frac{5\pi}{3}}^{\frac{7\pi}{3}} \frac{1}{2}(1-2cos\theta)^2 d\theta$

III. $\int_{0}^{\frac{\pi}{3}} (1-2cos\theta)^2 d\theta$

IV. $\int_{\frac{5\pi}{3}}^{2\pi} (1-2cos\theta)^2 d\theta$

$2\pi + \frac{\pi}{3} = \frac{6\pi + \pi}{3} = \frac{7\pi}{3}$

(A) I and II only
(B) I and III only
(C) I, II and III only
(D) I, III and IV only
(E) II, III and IV only
(F) I,II,III and IV



$2\int_{0}^{\pi/3} \frac{1}{2}(1-2\cos\theta)^2 d\theta$

5. The definite integrals which gives the area bounded by the inner loop of $r(\theta) = 1 + 2sin\theta$ are:

I. $\int_{\frac{7\pi}{6}}^{\frac{11\pi}{6}} \frac{1}{2}(1 + 2sin\theta)^2 d\theta$

II. $\int_{\frac{7\pi}{6}}^{\frac{3\pi}{2}} (1 + 2sin\theta)^2 d\theta$

III. $\int_{\frac{3\pi}{2}}^{\frac{11\pi}{6}} (1 + 2sin\theta)^2 d\theta$

IV. $\int_{\frac{5\pi}{6}}^{\frac{11\pi}{6}} \frac{1}{2}(1 + 2sin\theta)^2 d\theta$

(A) I and II only

(B) I and III only

(C) I, II and III only

(D) I, III and IV only

(E) II, III and IV only

(F) I,II,III and IV