10.3

41) $r = 2 - 3\sin\theta$ $\quad x = (2-3\sin\theta)\cos\theta$ $\quad y = (2-3\sin\theta)\sin\theta$

$\frac{dx}{d\theta} = -3\cos^2\theta - \sin\theta(2-3\sin\theta)$

$\frac{dy}{d\theta} = -3\cos\theta\sin\theta + \cos\theta(2-3\sin\theta)$

$\frac{dy}{dx} = \frac{\frac{dy}{d\theta}}{\frac{dx}{d\theta}} = \frac{-3\cos\theta\sin\theta + \cos\theta(2-3\sin\theta)}{-3\cos^2\theta - \sin\theta(2-3\sin\theta)}$

$\theta = 0$

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

$\theta = \frac{3\pi}{2}$

.99 .966 -.034

$\int_{-9.42}^{-8.63} 4\cos 2\theta\, d\theta + \int_{-3.79}^{-\pi} + \int_{8.63}^{8.77}$

47) $r^2 = 4\cos 2\theta$ $\quad r^2 = 4\cos 2\theta$

$r = \pm\sqrt{4\cos 2\theta}$ $\quad r = \pm\sqrt{4\cos 2\theta}$

$-3\pi, 3\pi$

$r^2 = 4\cos 2\theta$

$r = \pm\sqrt{4\cos 2\theta}$

$\frac{1}{2}\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} 4\cos 2\theta\, d\theta$

$\frac{1}{2}\int_{\frac{\pi}{4}}^{\frac{3\pi}{4}} 4\cos 2\theta\, d\theta$

53) $\frac{1}{2}\int_{\frac{\pi}{2}}^{\frac{3\pi}{2}} (2)^2\, d\theta + \frac{1}{2}\int_{-\frac{\pi}{2}}^{\frac{\pi}{2}} (2(1-\cos\theta))^2\, d\theta$

29) $r \cdot r = 8\sin\theta \cdot r$

$r^2 = 8r\sin\theta \rightarrow x^2 + y^2 = 8y$

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29 cont. $x^2 + y^2 = 8y$

$x^2 + (y^2 - 8y \quad) = 0$

51 $\frac{1}{2}\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (2\cos\theta)^2 \, d\theta + \frac{1}{2}\int_{0}^{\frac{\pi}{4}} (2\sin\theta)^2 \, d\theta$

39 $r = -1 + \sin\theta$

$x = \underset{f}{(-1+\sin\theta)}\underset{g}{\cos\theta}$ $\qquad$ $y = \underset{f}{(-1+\sin\theta)}\underset{g}{\sin\theta}$

$\frac{dx}{d\theta} = \cos^2\theta + -\sin\theta(-1+\sin\theta)$ $\qquad$ $\frac{dy}{d\theta} = \cos\theta\sin\theta + \cos\theta(-1+\sin\theta)$

$$\frac{dy}{dx} = \frac{\frac{dy}{d\theta}}{\frac{dx}{d\theta}} = \frac{\cos\theta\sin\theta + \cos\theta(-1+\sin\theta)}{\cos^2\theta - \sin\theta(-1+\sin\theta)}$$

0,

$\pi$,