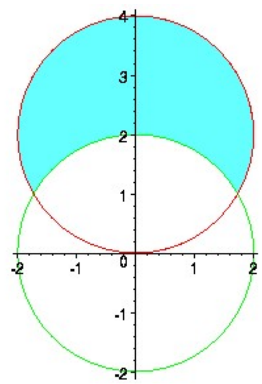
Math 152 Name____________KEY____________

Quiz 11

1. Carefully sketch the region that is inside $r = 4\sin\theta$ but outside $r = 2$. Then, write an integral expression that represents the area of the region. Do not evaluate your integrals.



2. Find the slope of the curve $r = 4\sin\theta$ at the point where $\theta = \frac{5\pi}{6}$.

$$x = r\cos\theta = 4\sin\theta\cos\theta$$
$$y = r\sin\theta = 4\sin\theta\sin\theta$$
$$\frac{dy}{dx} = \frac{\left(\frac{dy}{d\theta}\right)}{\left(\frac{dx}{d\theta}\right)} = \frac{8\sin\theta\cos\theta}{4(\cos\theta)^2 - 4(\sin\theta)^2}$$
$$\left.\frac{dy}{dx}\right|_{\theta=\frac{5\pi}{6}} = \frac{8(\frac{1}{2})(-\frac{\sqrt{3}}{2})}{4(-\frac{\sqrt{3}}{2})^2 - 4(\frac{1}{2})^2} = \frac{-2\sqrt{3}}{2} = -\sqrt{3}$$

3. Sketch a plot of the conic section described by $\frac{y^2}{9} - \frac{x^2}{25} = 1$ on the axes below. Make sure you show and label all important points and/or lines connected to this conic section.