Math 143 Sample Problems for Exam 2

Question 1 Find the Taylor series for $f(x) = \cos x$ centered at the point $x = \pi/4$.

Question 2 For the parametric curve $x = e^t(\cos t + \sin t)$, $y = e^t(\cos t - \sin t)$, find the equation of the tangent line at the point where $t = \pi/4$. Find the length of the curve from $t = 0$ to $t = \pi/2$. Set up, but do not evaluate an integral that represents the area of the surface of revolution gotten by rotating the curve from $t = 0$ to $t = \pi/2$ about the y–axis.

Question 3 Find the area enclosed by the cardioid $r = 2 + 2\cos\theta$. Find the equation of the tangent line to the cardioid at the point when $\theta = \pi/6$.

Question 4 Find the length of the spiral $r = 3^{-\theta}$ from $\theta = -\pi/2$ to $\theta = \pi/2$.

Question 5 Find the equation of the sphere whose diameter has endpoints $(1, 2, 3)$ and $(-1, 4, -6)$.

Question 6 Something from sections 13.2 and 13.3 if we get there.