Chapter 10 and 12 Review Test

1) Given $x = t^2$ and $y = t^3, 0 \leq t \leq 1$ find the following:
   a. Tangent line at $\left(\frac{1}{4}, \frac{1}{8}\right)$
   b. Area under the curve
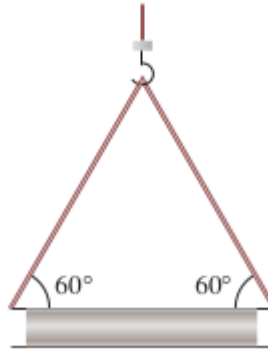   c. Surface Area rotated around the x-axis

2) Given $r = 2 \sin \theta$, $0 \leq \theta \leq \pi$ find the following:

a. Tangent line at $\theta = \dfrac{\pi}{2}$

b. Area under the curve

c. Arc Length

3) A crane suspends a 400-lb steel beam horizontally by support cables attached from a hook to each end of the beam. The support cables each make an angle of 60^0 with the beam. Find the tension vector in each support cable and the magnitude of each tension

4) Find the angle between the vectors **u = I − 3j + 2k** and **v = −2i + j + 4k.**

5) Use the scalar triple product to determine whether the points A(3, 0, 2), B(-1, 2, 5), C(5, 1, -1) and (0, 4, 2) lie in the same plane