Recitation # 5: Length of Curves & Surface Area - Instructor Notes

Group work:

Problem 1 *Find the length of the following curves (length is in feet):*

(a) $y = \frac{1}{6}x^3 + \frac{1}{2x}$ *from* $\left(2, \frac{19}{12}\right)$ *to* $\left(3, \frac{14}{3}\right)$.

(b) $x = \frac{1}{9}e^{3y} + \frac{1}{4}e^{-3y}$ *from* $\left(\frac{13}{36}, 0\right)$ *to* $\left(\frac{265}{288}, \ln 2\right)$.

Instructor Notes: Split (a) and (b) amont the groups. Note that the focus here is on both the set-up **and** in solving the resulting integral (which boild down to writing the expression under the radical as a perfect square).

Problem 2 *Find the surface area of the surface generated by revolving the curve given by*

(a) $y = \frac{1}{6}x^3 + \frac{1}{2x}$ *from* $\left(2, \frac{19}{12}\right)$ *to* $\left(3, \frac{14}{3}\right)$ *about the x-axis.*

(b) $x = \frac{1}{9}e^{3y} + \frac{1}{4}e^{-3y}$ *from* $\left(\frac{13}{36}, 0\right)$ *to* $\left(\frac{265}{288}, \ln 2\right)$ *about the y-axis.*

Instructor Notes: Split (a) and (b) among the same groups as before. Make sure that the students are using the surface area formula and not the arc length formula.
