# MATH 243: SECTION 8.1 GROUPWORK

(1) Consider the curve $y = e^x$ from the point $(0, 1)$ to $(2, e^2)$. Set up two integrals to calculate the arc length of this curve, one integral taken with respect to $x$ and the other with respect to $y$.

(2) Consider the curve $x = \ln(\cos y)$ from the point $(0, 0)$ to $(\ln(1/2), \pi/3)$. Calculate the exact length of this curve.

(3) Consider the function $f(x) = \frac{1}{4}e^x + e^{-x}$. Show that for any real numbers $a < b$ that the arc length of the curve of $f(x)$ from $x = a$ to $x = b$ is same quantity as the area under the curve $f(x)$ from $x = a$ to $x = b$.