Section 6.5: Length of Curves

Group work:

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

(a) $y = \frac{4}{3}x^{\frac{3}{2}}$ *from* $(0,0)$ *to* $\left(1, \frac{4}{3}\right)$.

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

Problem 2 **Set up** *an integral (or a sum of integrals) to find the perimeter of the region bounded by the curves* $y = 2x^2 - 5x + 13$ *and* $y = x^2 + 6x - 11$.

Problem 3 *A steady wind blows a kite due west. The kite's height above the ground from horizontal position* $x = 0$ *ft. to* $x = 80$ *ft. is given by*

$$y = 150 - \frac{1}{40}(x - 50)^2.$$

Set up the integral to find the distance traveled by the kite.

Learning outcomes: