

**Exercise 1.1.6**

Newton asked the question, what is the curve which, when revolved about an axis, gives a surface offering the least resistance to motion through a “rare” fluid (e.g. air)? Newton’s answer is the following curve (see Chapter 7).

$$(x(t), y(t)) = \left( \frac{\lambda}{2} \left[ \frac{1}{t} + 2t + t^3 \right], \frac{\lambda}{2} \left[ \ln \left( \frac{1}{t} \right) + t^2 + \frac{3}{4}t^4 \right] - \frac{7}{8}\lambda \right),$$

where  $\lambda$  is a positive constant and  $x \geq 2\lambda$ . Graph this curve and compute its velocity and acceleration vectors. What angle does the curve make with the  $x$ -axis at the intersection point  $(2\lambda, 0)$ ?