Assignment #8
Max and Min and Hare today ...
Due on Friday, 16 November.

Little Max is walking Big Min the math dog on a $2\ m$ leash, moving left along the x-axis in the Cartesian plane. Big Min is an eager walker, keeping the leash fully extended at all times. Just as Big Min reaches the origin, Big Min spots a Splitting Hare on the y-axis. The Splitting Hare runs straight up the y-axis to get away and Big Min follows, also running directly up the y-axis while dragging Little Max, who continues to hang onto the leash. Thanks to the leash, Little Max is always moving directly towards Big Min and is always $2\ m$ away. Dragging Little Max along slows Big Min just enough so as to never catch up to the Splitting Hare.

1. Find the function $f(x)$ whose graph $y = f(x)$ for $0 < x \le 2$ is the path traced out by Little Max while being dragged by Big Min when following Splitting Hare. *[10]*

Hint: Your real task is to set up a suitable differential equation. Once you have that, get a certain computer program to solve it for you ...