2. [12 points]
A portion of the graph of the function $m(t)$ is shown to the right. Note the following facts about $m(t)$:

- on the interval $t < 2$, we have $m(t) = e^{t-1}$;
- on the interval $2 < t < 4$, the graph of $m(t)$ is a quarter of a circle;
- $m(t)$ is piecewise linear on the interval $4 < t < 6$;
- $m(t)$ is linear on the interval $t > 6$.

a. [5 points]
On the axes to the right, sketch a detailed graph of $m'(t)$, the derivative of $m(t)$, for $0 \leq t \leq 8$. Make sure the following are clear from your graph:

- where $m'(t)$ is undefined;
- any vertical asymptotes of $m'(t)$;
- where $m'(t)$ is zero, positive, or negative;
- where $m'(t)$ is increasing, decreasing, or constant;
- where $m'(t)$ is linear (with correct slope).

b. [7 points]
Let $M(t)$ be a continuous antiderivative of $m(t)$ satisfying $M(2) = 2$. On the axes to the right, sketch a detailed graph of $M(t)$ for $0 \leq t \leq 8$. Note that $\pi \approx 3.14$, $e \approx 2.72$ and $e^{-1} \approx 0.37$. Make sure the following are clear from your graph:

- where $M(t)$ is and is not differentiable;
- the approximate values of $M(t)$ at $t = 0, 3, 4, 5, 6, 7, \text{ and } 8$;
- where $M(t)$ is increasing, decreasing, and constant;
- the concavity and any inflection points of $M(t)$. 