1. (5pts) Sketch the curve defined by the parametric equations.

\[
\begin{align*}
  x &= \ln t \\
  y &= \sqrt{t}, \quad t \in [1, 6]
\end{align*}
\]

2. (2pts) Eliminate the parameter to find a Cartesian equation of the curve.

3. (3pts) Set up, but do not evaluate, an integral that represents the length of the curve.

\[
\begin{array}{c|c|c|c|c|c|c}
  t & 1 & 2 & 3 & 4 & 5 & 6 \\
  \hline
  x & 0 & 0.6 & 1.1 & 1.2 & 1.3 \\
  y & 1 & 1.4 & 1.6 & 2 & & \\
\end{array}
\]

\[
x > 0 \text{ and } y > 0
\]

\[
t = e^x \Rightarrow y = \sqrt{e^x} = e^{x/2}, \quad x \in [0, 6]
\]

\[
L = \int_{1}^{6} \sqrt{\left(\frac{dx}{dt}\right)^2 + \left(\frac{dy}{dt}\right)^2} \, dt
\]

\[
\frac{dx}{dt} = \frac{1}{t}, \quad \frac{dy}{dt} = \frac{1}{2\sqrt{t}}
\]

So that

\[
L = \int_{1}^{6} \sqrt{\frac{1}{t^2} + \frac{1}{4t}} \, dt = \int_{1}^{6} \frac{1}{2t} \sqrt{4t+1} \, dt
\]