Problem 1  (3 points)

The impedance of an acoustic wave is the ratio of pressure divided by velocity,

\[ Z = \frac{P}{U} \]

where \( P \) is in Pascals, and \( U \) is in meters/second. What are the units of \( Z \)?

Problem 2  (5 points)

As a pure tone sounds out in the concert hall, the air pressure around my ears oscillates according to:

\[ p(t) = 0.1 \cos(200\pi t) \]

Plot one full period of \( p(t) \), and one full period of \( \frac{dp}{dt} \) (you may put these plots on the back of this piece of paper if you like). Give the period and the amplitude of each of these two waveforms.

Problem 3  (2 points)

Plot the function \( x(t) = e^{t \ln(2)} \), for \( 0 \leq t \leq 2 \). You may plot this function on the other side of this piece of paper if you like.