## In-class review for Section 7.6

1 Express the piecewise defined function

$$
f(t)= \begin{cases}2 & 0<t<3 \\ 0 & 3<t<7, \\ t^{5} & 7<t<9 \\ \sin t & t>9\end{cases}
$$

in a single line in terms of Heaviside (unit step) functions.

2 Find the Laplace transform of the solution $y$ to the initial value problem

$$
2 y^{\prime \prime}-3 y^{\prime}+y=\left\{\begin{array}{ll}
t^{2} & 0<t<5, \\
\sin t & t>5
\end{array} \quad y(0)=1 ; \quad y^{\prime}(0)=0 .\right.
$$

3 Suppose that

$$
\mathscr{L}\{y\}=\frac{e^{-2 s}+s e^{-3 s}}{s^{2}+4} .
$$

What is $y$ ?

4 The half-rectified sine wave is equal to $\sin t$ when $\sin t$ is positive, and 0 otherwise.


Find the Laplace transform of the half-rectified sine wave.

