Submitting HW Tips

HW #9

1 Using our **Table of Elementary Laplace Transforms** (posted on our Brightspace page) and the linearity of the Laplace Transform, verify this Laplace Transform formula (which is **not** in our table):

$$\mathcal{L}\Big\{e^{at}\cosh bt\Big\} = \frac{(s-a)}{(s-a)^2 - b^2}.$$

2 **Section 6.2:** #3, 7, 8, (17) ← Just find the Laplace Transform $Y(s)$ i.e., $\mathcal{L}\big\{y(t)\big\} = Y(s)$

3 **Section 6.3:** #11, 12, 14.

4 Let $g(t)$ be the piecewise continuous function : $g(t) = \begin{cases} 0, & 0 < t \le 3 \\ 20, & 3 < t < \infty \end{cases}$

(a) Solve this **IVP** arising from a certain Spring-Mass System : $\begin{cases} y'' + 4y' + 4y = g(t) \\ \\ y(0) = 0, \;\; y'(0) = 0 \end{cases}$

(b) Determine the values $y(1)$ and $y(7)$.

(c) What is the **Steady-State Solution**?