6.3: Step functions.

$$u_c(t) = \begin{cases} 0 & t < c \\ 1 & t \geq c \end{cases}$$

1.) Graph $u_c(t)$:

2.) Given f, graph $u_c(t)f(t-c)$:

3.) Calculate $\mathcal{L}(u_c(t)f(t-c))$ in terms of $\mathcal{L}(f(t))$:

Example: Find the LaPlace transform of

4.) $$g(t) = \begin{cases} 0 & t < 3 \\ e^{t-3} & t \geq 3 \end{cases}$$

5.) $$f(t) = \begin{cases} 0 & t < 3 \\ 5 & 3 \leq t < 4 \\ t-5 & t \geq 4 \end{cases}$$

6.) Ex: Find the inverse Laplace transform of $\frac{e^{-8s}}{s^3}$

7.) Calculate $\mathcal{L}(e^{ct}f(t))$ in terms of $F(s) = \mathcal{L}(f(t))$

8.) Example: Use formula 6 (p. 317) to find the inverse LaPlace transform of $\frac{s-c}{(s-c)^2+a^2}$.