

Laplace transform information for Exam 2.

$$\mathcal{L}(1) = 1/s$$

$$\mathcal{L}(t^n) = n!/s^{n+1}$$

$$\mathcal{L}(e^{at}) = 1/(s - a)$$

$$\mathcal{L}(\sin \omega t) = \omega/(s^2 + \omega^2)$$

$$\mathcal{L}(\cos \omega t) = s/(s^2 + \omega^2)$$

$$\mathcal{L}(u(t - a)) = e^{-as}/s$$

$$\mathcal{L}(\delta(t - a)) = e^{-as}$$

$$\mathcal{L}(f^{(n)}) = s^n \mathcal{L}(f) - s^{n-1} f(0) - \dots - f^{(n-1)}(0)$$

$$\mathcal{L}\left(\int_0^t f(\tau) d\tau\right) = \frac{1}{s} \mathcal{L}(f)$$

$$\mathcal{L}(e^{at} f(t)) = F(s - a)$$

$$\mathcal{L}(u(t - a) f(t - a)) = e^{-as} F(s)$$

$$\mathcal{L}(t f(t)) = -F'(s)$$

$$\mathcal{L}(f(t)/t) = \int_s^\infty F(\sigma) d\sigma$$

$$\mathcal{L}(f * g) = \mathcal{L}(f) \mathcal{L}(g)$$

$$\mathcal{L}(f) = \frac{1}{(1 - e^{-ps})} \int_0^p e^{-st} f(t) dt \quad \text{if } f \text{ is } p \text{ periodic}$$