

Math 17 **B**

Kouba

Laplace Transform Formulas

Memorize the following Laplace transform formulas.

$$1.) \mathcal{L}\{1\} = \frac{1}{s}$$

$$2.) \mathcal{L}\{t\} = \frac{1}{s^2}$$

$$3.) \mathcal{L}\{t^2\} = \frac{2}{s^3}$$

$$4.) \mathcal{L}\{t^n\} = \frac{n!}{s^{n+1}} \quad \text{for } n = 1, 2, 3, 4, \dots$$

$$5.) \mathcal{L}\{\sin kt\} = \frac{k}{s^2 + k^2}$$

$$6.) \mathcal{L}\{\cos kt\} = \frac{s}{s^2 + k^2}$$

$$7.) \mathcal{L}\{e^{at}\} = \frac{1}{s - a}$$

$$8.) \mathcal{L}\{te^{at}\} = \frac{1}{(s - a)^2}$$

$$9.) \mathcal{L}\{t^2e^{at}\} = \frac{2}{(s - a)^3}$$

$$10.) \mathcal{L}\{t^ne^{at}\} = \frac{n!}{(s - a)^{n+1}}$$

$$11.) \mathcal{L}\{e^{at} \sin kt\} = \frac{k}{(s - a)^2 + k^2}$$

$$12.) \mathcal{L}\{e^{at} \cos kt\} = \frac{s - a}{(s - a)^2 + k^2}$$

$$13.) \mathcal{L}\{y'\} = s\mathcal{L}\{y\} - y(0)$$

$$14.) \mathcal{L}\{y''\} = s^2\mathcal{L}\{y\} - sy(0) - y'(0)$$