CHAPTER 25 - REMINDER SHEET

The subject of Chapter 25 is the inverse of the *Laplace transform.* Recall that for a real-valued function $f : (0, \infty) \to \mathbb{R}$ the Laplace transform is defined as

$$F(s) = \mathscr{L}\{f(y)\}(s) = \int_0^\infty \exp(-st) f(t) dt.$$

Then we have the following theorem:

Theorem: Suppose that f and g are functions such that $F(s) = G(s)$. Then $f(t) = g(t)$.

This assures that the Laplace transform is invertible, i.e. the function defined by the assignment $F(s) \mapsto f(t)$ is actually a well-defined map. It is called the *inverse Laplace transform.*

Example: We had computed that $\mathscr{L}\{t^n\}(s) = \frac{n!}{s^{n+1}}$. Thus the inverse Laplace transform of the function $\frac{n!}{s^{n+1}}$ is t^n.

As the Laplace transform is a linear map, the inverse Laplace transform is also a linear map.