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ECE 3510 Finish Ch 2

Non-strictly-proper transforms

section 2.2.5, in Bodson text

What if the order of the numerator is equal to or even greater than the order of the denominator? $m \geq n$?

Example: $F(s) = \dfrac{2 \cdot s^2 + 100}{s^2 + 8 \cdot s + 41}$ $m := 2$ $n := 2$

First divide, before partial fraction expansion $s^2 + 8 \cdot s + 41 \overline{\big)\; 2 \cdot s^2 + 0 \cdot s + 100}$

"remainder"

$$F(s) = \frac{2 \cdot s^2 + 100}{s^2 + 8 \cdot s + 41} =$$

f(t) =

Delta functions are not very common in real life.
Non-strictly-proper transforms are just as common.

Properties of Signals

Can you tell what f(t) must be just by looking at F(s)? YES, somewhat...
SEE last page of Lect 2 & 3 notes

$$\frac{s + 5}{s \cdot \left(s^2 + 4 \cdot s + 13\right) \cdot (s - 10)}$$

$$\frac{s + 5}{s \cdot \left(s^2 + 64\right) \cdot (s + 10)}$$

$$\frac{s + 5}{s \cdot \left(s^2 - 4 \cdot s + 13\right) \cdot (s + 10)}$$

$$\frac{s + 5}{s \cdot \left(s^2 + 4 \cdot s + 13\right)^2 \cdot (s + 10)}$$

$$\frac{s + 5}{s^3 \cdot \left(s^2 + 4 \cdot s + 13\right)^2 \cdot (s + 10)^2}$$