Last Class…

Find f(t)

$$\boldsymbol{F}(s) = \frac{4}{(s+1)(s+2)^2}$$

$s_1 = -1$ $s_2 = -2$ $s_3 = -2$

$$F(s) = \frac{A}{s+1} + \frac{B}{s+2} + \frac{C}{(s+2)^2}$$

$$A = F(s)\cdot(s+1)\Big|_{s=-1}$$

$$= \frac{4}{(s+2)^2}\Big|_{s=-1}$$

$$= \frac{4}{1} = 4$$

$A = 4$

$$C = F(s)\cdot(s+2)^2\Big|_{s=-2}$$

$$= \frac{4}{s+1}$$

$$= \frac{4}{-1} = -4$$

$C = -4$

$$F(s) = \frac{4}{s+1} + \frac{B}{s+2} - \frac{4}{(s+2)^2} = \frac{4}{(s+1)(s+2)^2}$$

$$4(s+2)^2 + B(s+1)(s+2) - 4(s+1) = 4$$

$$4(s^2+4s+4) + B(s^2+2s+2) - 4s - 4 = 4$$

$$s^2\underbrace{(4+B)}_{=0} + s\underbrace{(16+2B-4)}_{=0} + \underbrace{16+2B-4}_{=4} = 0s^2 + 0s + 4$$

$4+B=0$

$\hookrightarrow B=-4$

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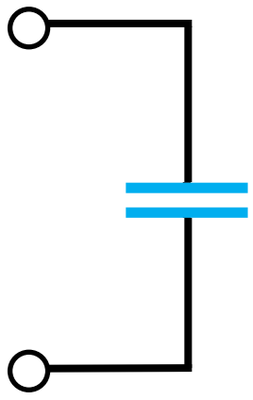
s-Domain Circuit Elements Model

After This Lecture…

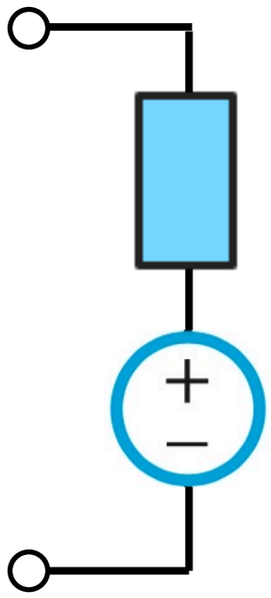
- Learning Objectives:
  - Use the Laplace transform for circuit analysis.

Capacitor

Time Domain



Frequency Domain



Inductor

Time Domain

Frequency Domain