Homework

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Midterm Project

Problem 1 (redux)

(a)

$$\lim_{s\to\infty} s \times \frac{1}{s} \times \frac{\frac{1}{s^2+s+2}}{1+\frac{1}{s^2+s+2}\times\frac{1}{s+1}} = 0$$

$$\lim_{s\to\infty} s \times \frac{1}{s^2} \times \frac{\frac{1}{s^2+s+2}}{1+\frac{1}{s^2+s+2}\times\frac{1}{s+1}} = 1$$

$$\lim_{s\to\infty} s \times \frac{1}{s^3} \times \frac{\frac{1}{s^2+s+2}}{1+\frac{1}{s^2+s+2}\times\frac{1}{s+1}} = \infty$$

(b)

$$\lim_{s\to\infty} s \times \frac{1}{s} \times \frac{\frac{1}{s(s+5)}}{1+\frac{1}{s(s+5)}\times 5} = 0.2$$

$$\lim_{s\to\infty} s \times \frac{1}{s^2} \times \frac{\frac{1}{s(s+5)}}{1+\frac{1}{s(s+5)}\times 5} = \infty$$

$$\lim_{s\to\infty} s \times \frac{1}{s^3} \times \frac{\frac{1}{s(s+5)}}{1+\frac{1}{s(s+5)}\times 5} = \infty$$

(c)

$$\lim_{s\to\infty} s \times \frac{1}{s} \times \frac{\frac{1}{s^2(s+10)}}{1+\frac{1}{s^2(s+10)} \times \frac{s+1}{s+5}} = 5$$

$$\lim_{s\to\infty} s \times \frac{1}{s^2} \times \frac{\frac{1}{s^2(s+10)}}{1+\frac{1}{s^2(s+10)} \times \frac{s+1}{s+5}} = \infty$$

$$\lim_{s\to\infty} s \times \frac{1}{s^3} \times \frac{\frac{1}{s^2(s+10)}}{1+\frac{1}{s^2(s+10)} \times \frac{s+1}{s+5}} = \infty$$

(d)

$$\lim_{s\to\infty} s \times \frac{1}{s} \times \frac{\frac{1}{s^2(s+12)}}{1+\frac{1}{s^2(s+12)} \times 5(s+2)} = 0.1$$

$$\lim_{s\to\infty} s \times \frac{1}{s^2} \times \frac{\frac{1}{s^2(s+12)}}{1+\frac{1}{s^2(s+12)} \times 5(s+2)} = \infty$$

$$\lim_{s\to\infty} s \times \frac{1}{s^3} \times \frac{\frac{1}{s^2(s+12)}}{1+\frac{1}{s^2(s+12)} \times 5(s+2)} = \infty$$