No.

Date

Sistem Kendali

1/9/22

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NIM. 21/480765/PA/20904

1. $G(s) = \frac{Y(s)}{U(s)} = \frac{700}{(s+15)(s^2+4s+500)}$

(a) What are the poles of this system (or what are the roots of the characteristic polynomial of this system? Is it stable or unstable?

$(s+15)(s^2+4s+500) = s^3+19s^2+560s+7500 = 0$

poles : $(s+15)(s^2+4s+500) = 0$

$s+15 = 0 \rightarrow s_1 = -15$

$s^2+4s+500 = 0 \rightarrow s_2 = \frac{-4+\sqrt{4^2-4.1.500}}{2} = -2+8\sqrt{31}\,i$

$s_3 = \frac{-4-\sqrt{4^2-4.1.500}}{2} = -2-8\sqrt{31}\,i$

Routh

| | | |
|---|---|---|
| $s^3$ | 1 | 560 |
| $s^2$ | 19 | 7500 |
| $s^1$ | $165\frac{5}{19}$ | 0 |
| $s^0$ | 7500 | |

jadi, fungsi transfer tersebut stabil