DEFEMIN	611			2	
<u>1.</u> Y	= R Pu	() * - M >	$+P_2Z$		
	(1 + RPu	M) = RPa	y* + P2 Z		
		3			
	(D) =	$\frac{R(s)P_{u}(s)}{R(s)P_{u}(s)}$	<u>γ</u> (α)+	1+ R(s) Pu (s) M(Z (x
		(b) Pe (b) M		2 + K (23) P ₆₄ (23) 11(2	3.)
2. E	= y * -	ум	9,	M Z	
		· \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	<u>.</u>		
	= Y * -	R Pu M	$\frac{P_z}{P_z}$	<u> </u>	
AND THE PARTY OF T	<u> </u>	1 + RPuM	- 1+ KI		
	= 1 + R	Pum - RPum + RPum	y* - Pz	M Z PuME	
	= <u>1 + R</u>	Pum - RPum + RPum	y* - Pz	M Z PuM*	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuME	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	
	= 1 + R 1	Pum - RPum + RPum	y* - P2 1+6 y*(s) -	M Z PuM ² M(s) P ₂ (s)	

OEFENING 2 1. Cdy = u - Quit met y-z= Quit R drukieischil = debiet, wegistand -> Cdy = u - y-z 2. RCdy + y = Ru +Z Zdy + y = Ru + z T (SY(S) - y(O))+Y(S)=RU(S) + Z(S) Y(s)(1+zs) = RU(s) + Z(s) + Zy(s) Y(s) = RU(s) + A Z(s) Y "0

3. Meem was eenwoud U(s) =0 alles relatief tou die
uaaide (z=0)
$\cdot \cdot$
$\Rightarrow \gamma(s) = 1 z(s) + R K \left[U(s) - \gamma(s) \right]$
1+DC $1+DC$
4
Y(s) = 1 + s = Z(s)
$\frac{1}{Y(n)} = \frac{1}{1+n\tau} \frac{Z(n)}{Z(n)}$ $\frac{1}{1+R} \cdot K$
1+50
= 1 Z(s) & Oplossing 9 1+5E+RK
1+DE +RK
/ N 1
Regimerraarde: lim s. Y(s) = zo = lim s. z
A DO THOU
1+RK 1+RK
Stapartwoord: 2(s)= 20
$\Rightarrow Y(s) = Z_0$ z_0/\overline{z} $met \overline{z}_1 = \overline{z}$
$\frac{1}{2} \frac{1}{2} \frac{1}$
$= A\left(\frac{1}{C} + A\right) + BA$
$S\left(\frac{A}{C} + S\right)$ $\rightarrow A : Z_0$
1 THE STATE OF THE
$\Rightarrow y(s) = z_0 + z$
4+RK D 4+RK (1+1)
- B = - 20 11 (C)
$\frac{1}{\varepsilon_{1}}$
$\Rightarrow g(t) = co (3 - e)$
M+RK 2- V MARK 2- C MARK 2

Topic 7 Regelaars
OFFEHING 1
niet Y
DEFENING 2
$Y = \frac{1}{s+a} \frac{K}{s^{n}} \left(Y^{*} - 1.Y \right)$
$\frac{Y}{A} + \frac{K}{K} = \frac{K}{K} + \frac{Y}{K}$
$\frac{\left((s+a)s^{n}\right)}{K} = \frac{(s+a)s^{n}}{k}$
$Y = \frac{(s+a)s^{h}}{1+K} \qquad Y = \frac{K}{(s+a)s^{h}+K}$
$(s+a)s^{-1}$ $\Rightarrow H(s) = \frac{1}{2} \frac{1}{$
$\Rightarrow H(s) = \frac{1}{(s+a)s} \times \frac{1}{(s+a)$
$\frac{* n = 0}{s + a + K}$
T/O stabiliteit: polen negatief → a+K > O of K>-a
Regimeuraarde y
Lan stapantumond
→ Regimeuraarde kan slechts gehaald worden met oneindig grote versterking K (fysisch onmogelijk)

polen regatief: & reele polen of & complex toegeroe - Som w/d polen = -a → regatief → a > 0 - Product v/d polen = K → positief → K > 0 Lieele polen indien a²-4K > 0 ~ K < a²/4 2 complex toegeroegde polen: a²-4K < 0 ~ K > a²/4 • y(t → ∞) = lim s K 1 = 1 > verbeterde performantie bij integrenende regeling		$H(n) = \frac{K}{n^2 + an + K}$	s ^e tas + K = 0
- Som w/d polen = -a > negatief > a > 0 - Product v/d polen = K > positief > K > 0 Lecele polen indien a - 4K > 0 ~ K < a / 4 2 complex to eaguroegde polen : a - 4K < 0 ~ K > a / 4 • y(t > 00) = lim 5 K	<u> </u>	len negatief: Lieële	polen of & complex toegeroed
2 recle polen indien $a^2 - 4K > 0$ as $K < a^2/4$ 2 complex to ea quo eg de polen: $a^2 - 4K < 0$ as $K > a^2/4$ $ y(t \to \infty) = \lim_{N \to \infty} S = K $		- som w/d polen = -a	-> negatief -> a>0
2 complex to equipped polen: $a^2 - 9K < 0 \implies K > a^2/4$ • $y(t \Rightarrow \infty) = \lim_{N \to \infty} S = M = M$ • we she tende performantie by integrenenche reaching lim $y(t) = \lim_{N \to \infty} Y(s)$ $t \Rightarrow \infty$		- Product v/d polen = K	-> positief -> K>0
ein y(t) = lim x x 1 = 1 verbeterde performantie bij intequerenche regeling	2	reele polen indien a ^e -	-4K>0 ~> K <a2 4<="" td=""></a2>
lim y(t) = lim s.y(s) t > 0	2.	complex to eastroegde polen	a ² -4K <0 10 K> a ² /4
lim y(t) = lim x y(x) t > > > > > > > > > > > > > > > > > >	· ų	$(t \rightarrow \infty) = \lim_{n \rightarrow 0} S$	K 1 = 1 +as+K s
lim $y(t) = \lim_{t \to \infty} y(t)$ $t \to \infty$ $y(t) = \lim_{t \to \infty} y(t)$			
$\lim_{E \to \infty} y(E) = \lim_{N \to \infty} y(N)$			
$\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$ $\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$ $\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$ $\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$			
$\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$			The second of th
$\lim_{t \to \infty} y(t) = \lim_{t \to \infty} y(t)$			
		The second secon	
	lim t→∞	$y(t) = \lim_{s \to \infty} s \cdot y(s)$	
	lim t→∞	$y(t) = \lim_{s \to 0} s \cdot y(s)$	
	lim E -> 0	$y(t) = \lim_{s \to 0} s \cdot y(s)$	
	lim t -> 0	$y(t) = \lim_{s \to 0} s \cdot y(s)$	
	lim E >> 0	$y(t) = \lim_{s \to 0} y(s)$	
	lim t -> 0	$y(t) = \lim_{s \to 0} y(s)$	
	lim E -> 0	$y(t) = \lim_{s \to 0} y(s)$	
	lim E -> =>	$y(t) = \lim_{N \to \infty} y(N)$	
	lim E -> \pi	$y(t) = \lim_{s \to 0} y(s)$	
	lim E -> 0	$y(t) = \lim_{s \to 0} y(s)$	
	1	$y(t) = \lim_{N \to \infty} y(N)$	
	1	$y(t) = \lim_{N \to \infty} y(N)$	

OFFENING 3 = PR (Yell - Y) PR yrej 1+PR 0,1 K (1 + 1/10s) (1+10s)
(1+10s) (1) H = 0,1K (1/100) = 0,1K $(1+100)^{3} + 0,1K (1/100) = 100 (1+100)^{3} + 0,1K$ Vitgang blyven oscilleren: Zuiver imaginalie polen (1 paar): s = ± jw 10 0 (1+100)3 +0,1K met 0=jW $10 \leq W \left(1 + 10 \leq W \times \right)^{3} + 0, 1 = 0$ $10 \leq W \left(1 + 30 \leq W - 300 \leq W^{2} - 1000 \leq W^{3}\right) + 0, 1 = 0$ $10 \leq W - 300 \leq W^{2} - 3000 \leq W^{3} + 10000 \leq W^{4} + 0, 1 = 0$ $(10W - 3000 W^{3})$; + $(-300 W^{2} + 10000 W^{4} + 0, 1K)$ =0

$10 \omega - 3000 \omega^3 = 0$
$\omega(10-3000 \omega^2) = 0$
$\omega^{\varepsilon} = 10$
3000
$\omega = \pm 1 \checkmark$ $10\sqrt{3}$
4
Inexellen in -300 W + 10 000 W + 0, 1K = 0
$\frac{-300}{300} \frac{1}{300} + \frac{10000}{300} \frac{1}{300} + 0, 1 = 0$
$\frac{-1+1}{9}+0,1K=0$
K = +8 = 80 / 9.0,1 9
J.0,1 J
Andere polen hoe winden?
more puen noe sisteres.

