Hi U

ARMA- equation الر  $y_t = 0.4y_{t-1} - 0.03y_{t-2} + 10 + u_t + u_{t-1}$ ,  $u_t \sim v$  life notse how many non-stationary solutions are there? preovide initial condians for one of them -1/ stationary solutions are there?
Find all of them. F(40)=4 13 (yi)=0 E (yz) = =-0.12+10  $y_2 = y_2 = 0.4 \cdot 0 - 0.03 \cdot (4 + u_0) + 10 + u_2 + u_1$ E(4)=0  $y_3 = 0.4y_2 - 0.03 \cdot 0 + 10 + u_3 + u_2$ Ver (y0)= =Vor (4+40)=  $0 = 0.4(4 + u_0) - 0.03y_{-1} + u_1 + u_0$ = 2 % Voc(y) =0 yo y= > fatronory: E(y=)=/, Voc(y=)= 22, (ov(y+, y+k)=/k If the ARMA-equation P(L). y = Q(L). Up to is not reducible & P(l) and Q(l) have no common roots & there three possible coses: > oll rook of All) one roof |C|=1

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of row

of solution has the form

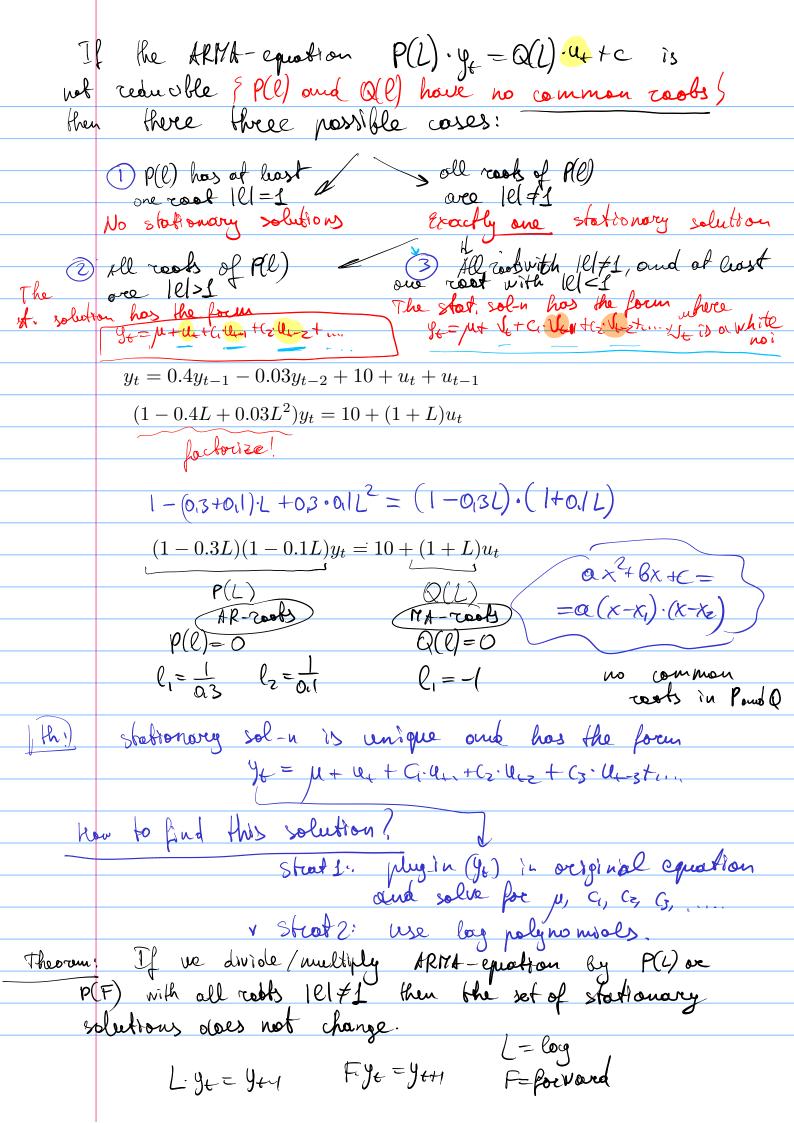
yo= \mu + u + (1, \text{u}) + (2, \text{u}) z + ....

No stationary solutions

Exactly one stationary solution

H workwith 1817, and of cost
one root with 18121
The stat, solution has the form where

he stati sol-n has the form where ye= not let Co Vertezting to is or white noise



$$\frac{1}{1-dL} = 1 + dL + 2^{2} + 2^{3}$$

$$(1 - 0.3L)(1 - 0.1L)y_t = 10 + (1 + L)u_t$$

$$y_t = \frac{1}{(1 - 0.3L)(1 - 0.1L)} \cdot 10 + \frac{1}{(1 - 0.3L)(1 - 0.1L)} (1 + L)u_t$$

$$\frac{1}{1-5L} = \frac{1}{-5L} \cdot \frac{1}{1-\frac{1}{5}F} = \frac{F}{-5} \cdot \frac{1}{1-\frac{1}{5}F}$$

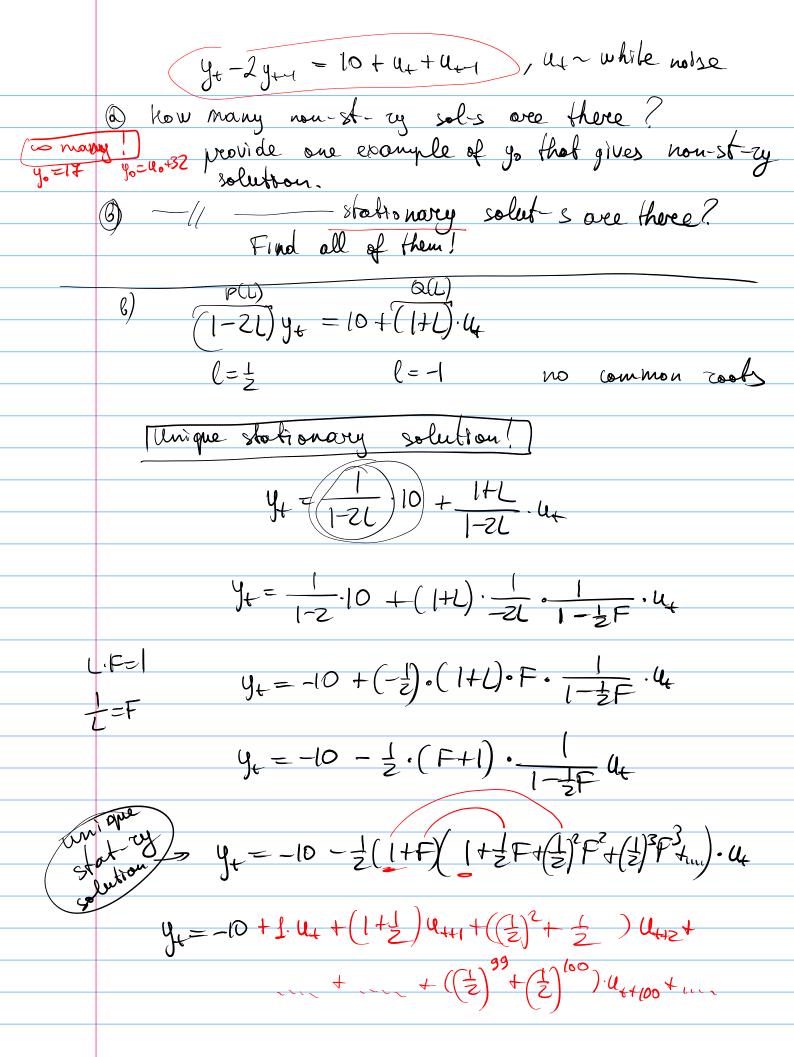
$$\frac{L \cdot F = F \cdot L = 1}{L \cdot F = F \cdot L = 1}$$

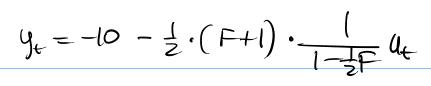
L·10=10 
$$F10=10$$
  $(2+3+3+2F1^2)\cdot 10=100$   $(1+7+2)\cdot 10=100$ 

$$\frac{1}{(1-03L)(1-0.1L)} \cdot 10 = \frac{1}{(1-0.3)\cdot(1+0.1)} \cdot 10 = \frac{10}{0.7\cdot0.9} = \frac{1000}{6.3}$$

$$y_t = \frac{1}{(1 - 0.3L)(1 - 0.1L)} 10 + \frac{1}{(1 - 0.3L)(1 - 0.1L)} (1 + L)u_t$$

$$y = \frac{1000}{63} + 1.4 + (0.1+0.3 + 1).4 + 0.3+0.1$$





According to the core 3 of the theorem this con be expressed as  $y_t = \mu + J_t + c_t J_{t-t} + c_z J_{t-z} + \dots$ where  $y_t$  is a white norse

c\*) express this (b) from (u).