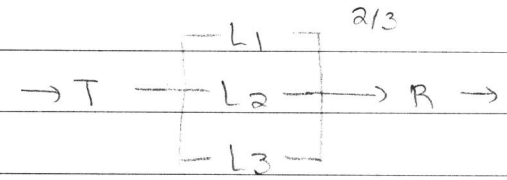
#1.



→ T → L → R →

since 2/3 must be available and they are identical:

$R_L = (R+Q)^3 = \underbrace{R^3 + 3R^2Q}_{\text{at least 2}}$

$R_L = R^3 + 3R^2(1-R)$

$R_L = R^3 + 3R^2 - 3R^3$

$R_L = 3R^2 - 2R^3$

$R_S = R_T \cdot R_L \cdot R_R$

$R_S = 0.98 \cdot 0.95 \cdot (3(0.9)^2 - 2(0.9)^3)$

$R_S = 0.98 \cdot 0.95 \cdot 0.972$

$R_S = 0.904932$

$\boxed{R_S = 0.905}$ uu move decimal places

#2. 4 identical pumps → 20 gallons/hr

get 40 gallons/hr or more output?

Pumps Working	Gallons/Hr	Prob
0	0	$(1)(0.1)^4$ = 0.0001
1	20	$(4)(0.1)^3(0.9)$ = 0.0036
2	40	$(6)(0.1)^2(0.9)^2$ = 0.0486
3	60	$(4)(0.1)^1(0.9)^3$ = 0.2916
4	80	$(1)(0.9)^4$ = 0.6561
		= 1

Probability of 40 gallons/hr or more

= 0.0486 + 0.2916 + 0.6561

$P(\geq 40 \text{ gallons/hr}) = 0.9963$ ✓