Exam April 2021
Please solve 2 exercises (not 1 not 3 exactly 2).

1:Ramsey Cass Koopmans

$Y = 0.1K^{0.5}(AL)^{0.5}$

There is no population growth or depreciation. A grows at rate 0.05

a) what steady state capital to effective labour ratio maximiizes the ratio of consumption to effective labour.

b)Find the steady state capital to effective labour ratio if consumers act to
maximize the presented discounted value of the square root of consumption with a discount rate of 0.05

c) Draw a phase diagram of c and k illustrating the convergence to the steady state you found

d extra credit) why is it impossible to solve the model if consumers utility is the square root of consumption discounted with a discount rate of 0.02 ?

2 Extended Solow

$Y = H^{0.25}K^{0.25}(AL)^{0.5}$

There is no depreciation or population growth. A grows at rate 0.05.

a) if $S_H = 0.4$ and $S_K = 0.4$ what is the steady state ratio of human capital to effectve labour (h) and what is the steady state ratio of capital to effective labour (k).
b) What is the balanced growth rate of growth of GDP ?
c) what is the steady state ratio of consumption to effective labour (c) ?
d) if $S_H = 0.25$ and $S_K = 0.25$ what are steady state k and h ?
e) what is the balanced growth rate of GDP ?
f) what is steady state c ?
g) please draw a phase diagram illustrating the dynamics if $S_H = 0.25$ and $S_K = 0.25$

3) consumption with risk

2: Consider a consumer who chooses C_1 and C_2 to maximize
$C_1^{0.5} + C_2^{0.5}$

Subject to the budget constraint
$C_1 + C_2 = W_1 + W_2$

With $W_1 = 1$ and
$W_2 = 19$ with probability 0.5
And $= 43/9$ with probability 0.5

a)What is C_1 (hint it is an integer) ?

b)Now what is C_1 if $W_2 = 214/9$ (so $E(W_2)$ is the same as it was) ?
c) Now what is C1 if there is the additional constraint that $C_1 <= W_1$?