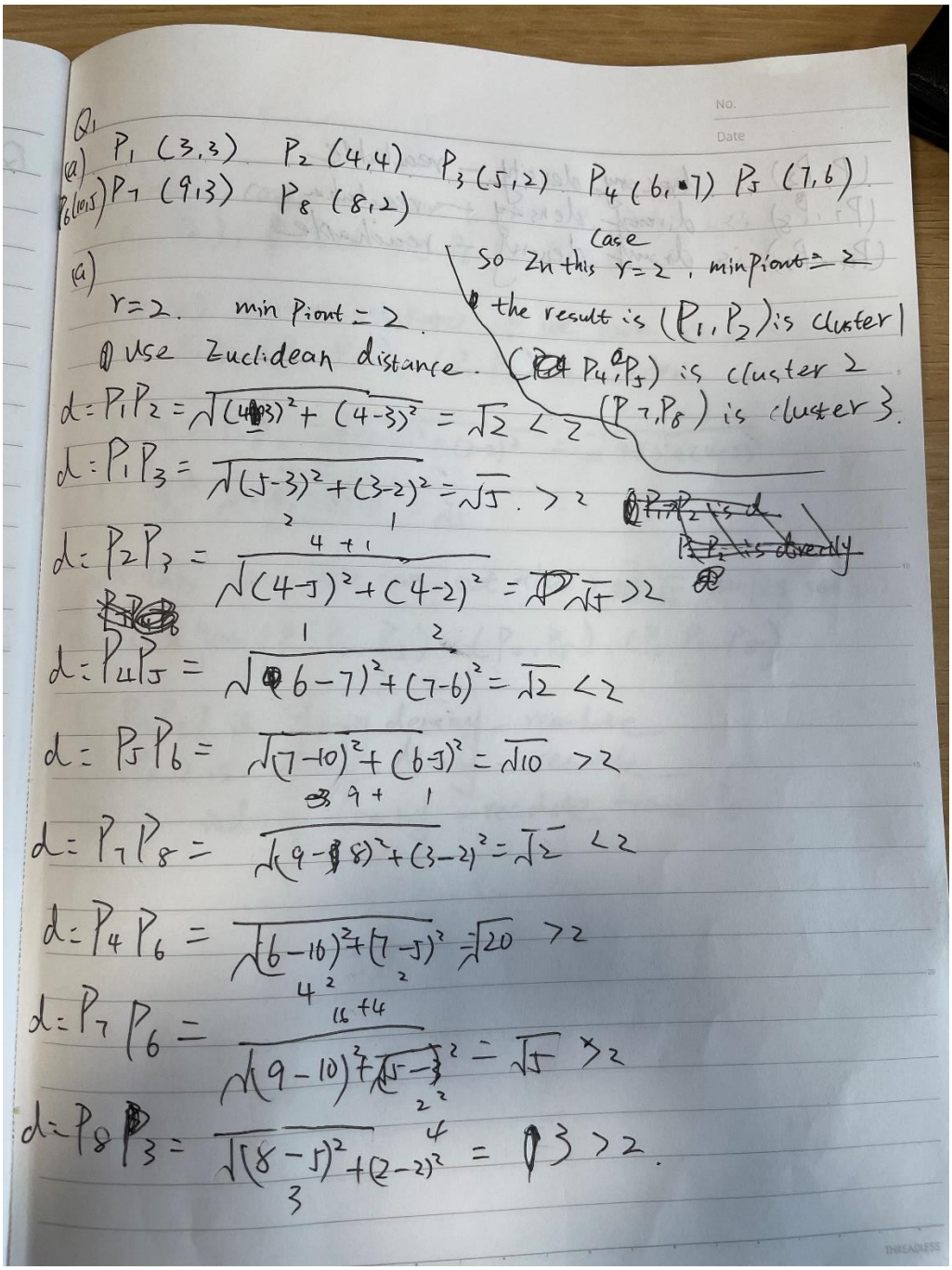
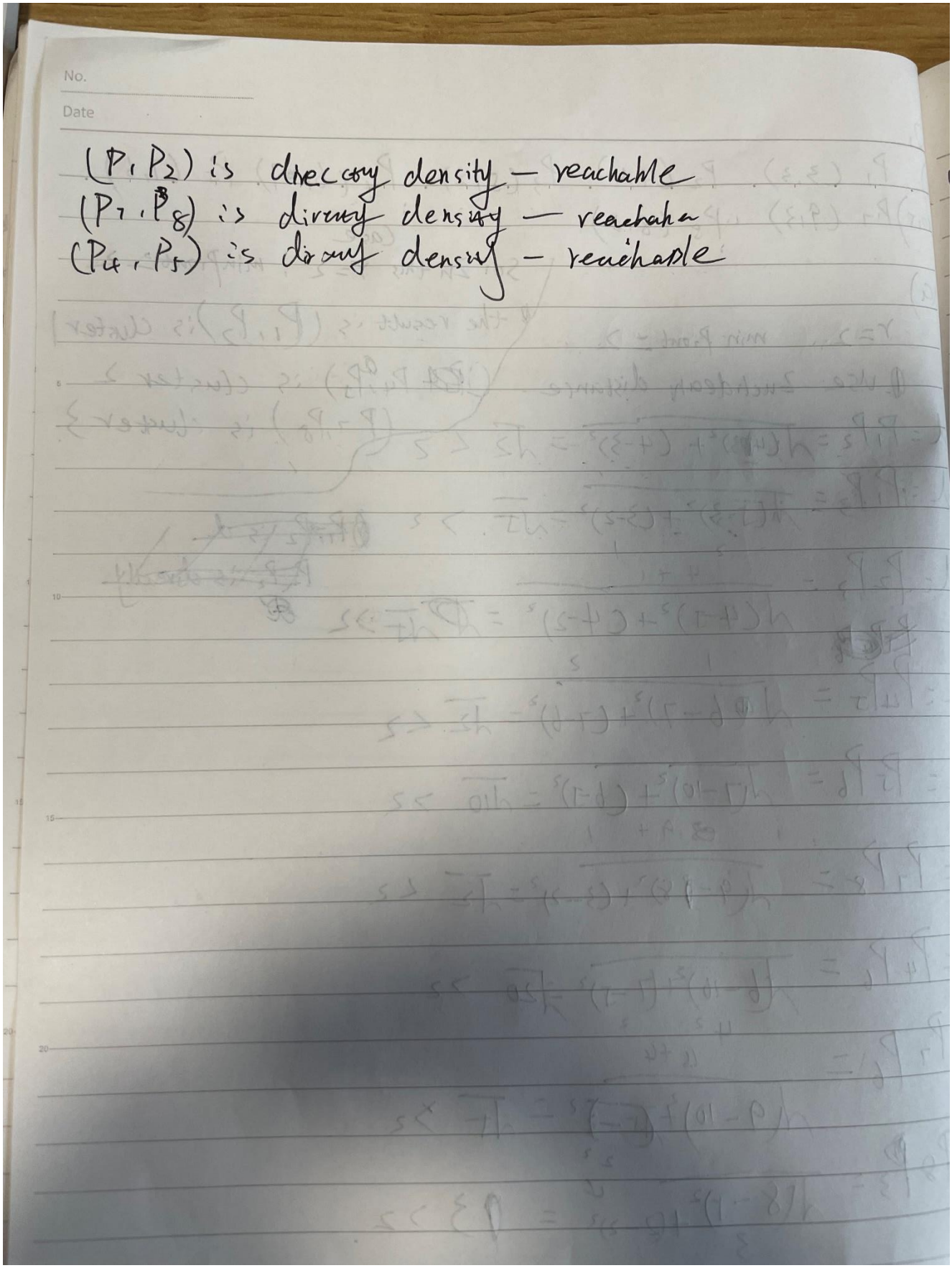
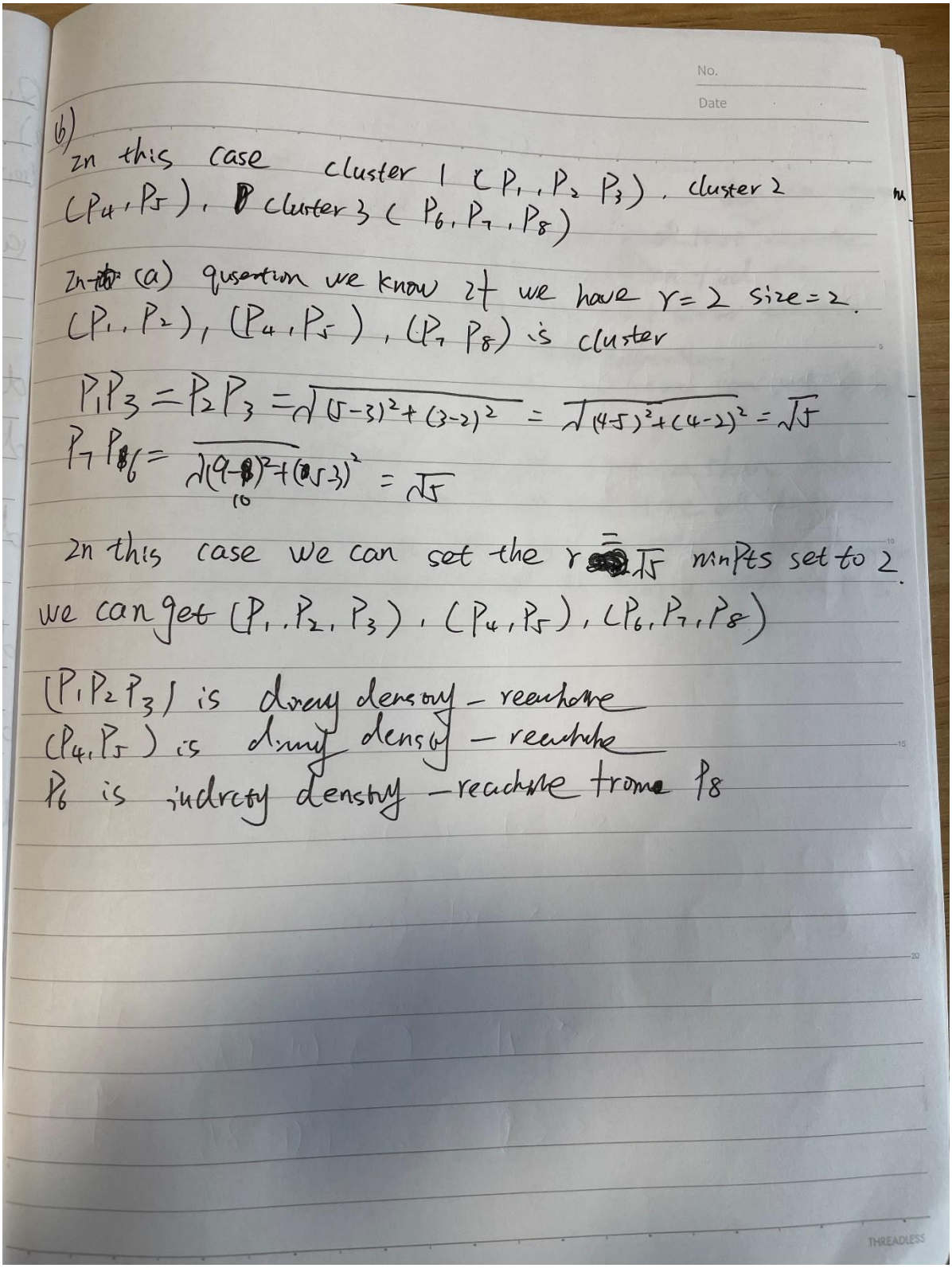
ID 2335100
Exam for # Artificial Intelligence 1/Artificial Intelligence and Machine Learning




No.
Date
(P1, P2) is directly density – reachable
(P7, P8) is directly density – reachable
(P4, P5) is directly density – reachable



b)

In this case cluster 1 (P_1, P_2, P_3), cluster 2 (P_4, P_5), cluster 3 (P_6, P_7, P_8)

In (a) question we know if we have $r=2$ size $=2$. (P_1, P_2), (P_4, P_5), (P_7, P_8) is cluster

$$P_1P_3 = P_2P_3 = \sqrt{(5-3)^2+(3-2)^2} = \sqrt{(4-5)^2+(4-2)^2} = \sqrt{5}$$

$$P_7P_8 = \sqrt{(9-8)^2+(8-3)^2} = \sqrt{5}$$

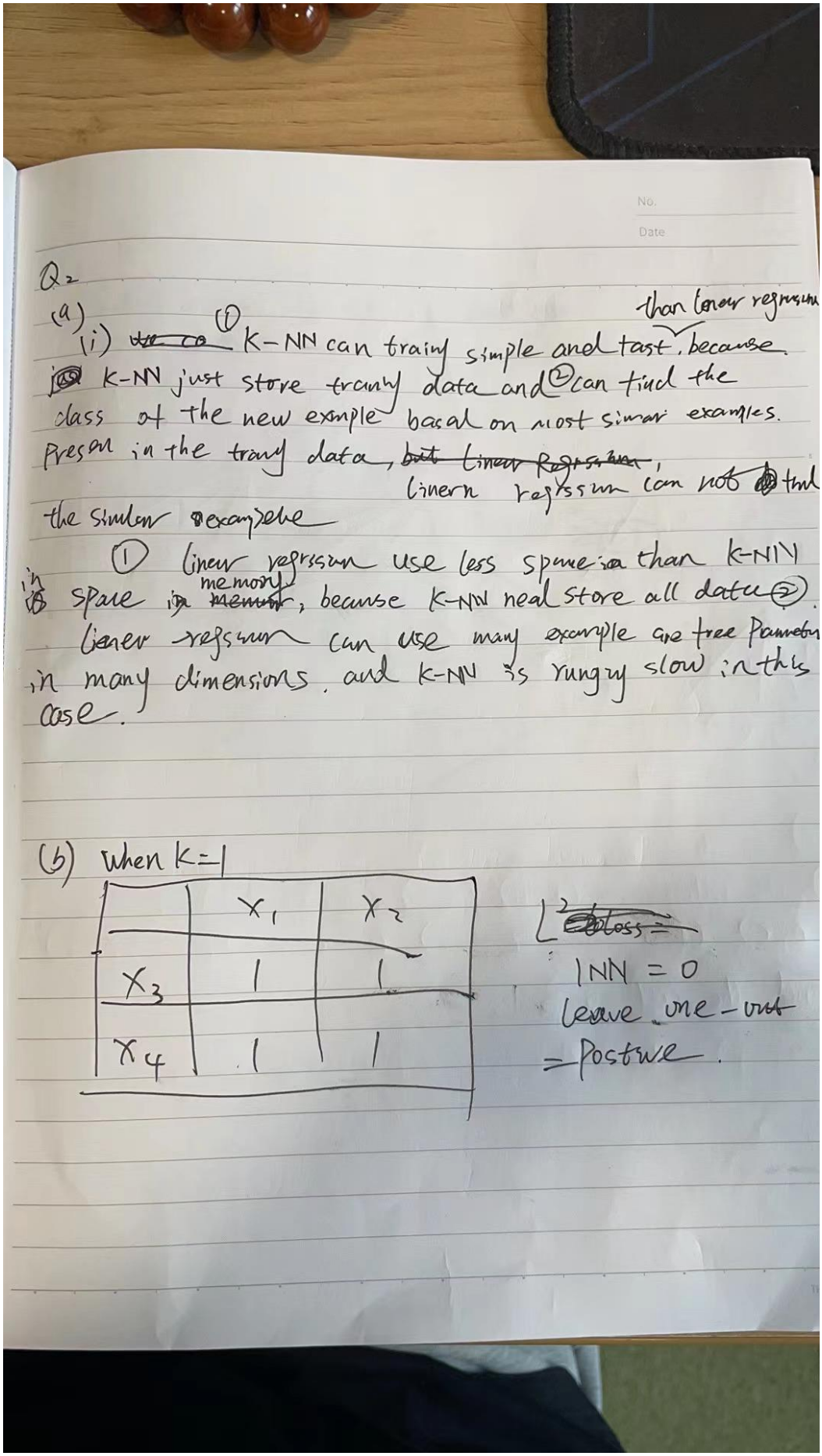
In this case we can set the r $\sqrt{5}$ minPts set to 2.

we can get (P_1, P_2, P_3), (P_4, P_5), (P_6, P_7, P_8)

($P_1P_2P_3$) is directly density-reachable

(P_4, P_5) is directly density-reachable

P_6 is indirectly density-reachable from P_8



Q2

(a)

i) ① K-NN can train simple and fast than linear regression, because K-NN just store train data and ② can find the class of the new example based on most similar examples. Person in the train data, ~~but linear Regression~~, linern regression can not find the similar examples

① linear regression use less space than K-NN in memory, because K-NN need store all data ②. linear regression can use many example are free Parameters in many dimensions. and K-NN is rungry slow in this case.

(b) When K=1

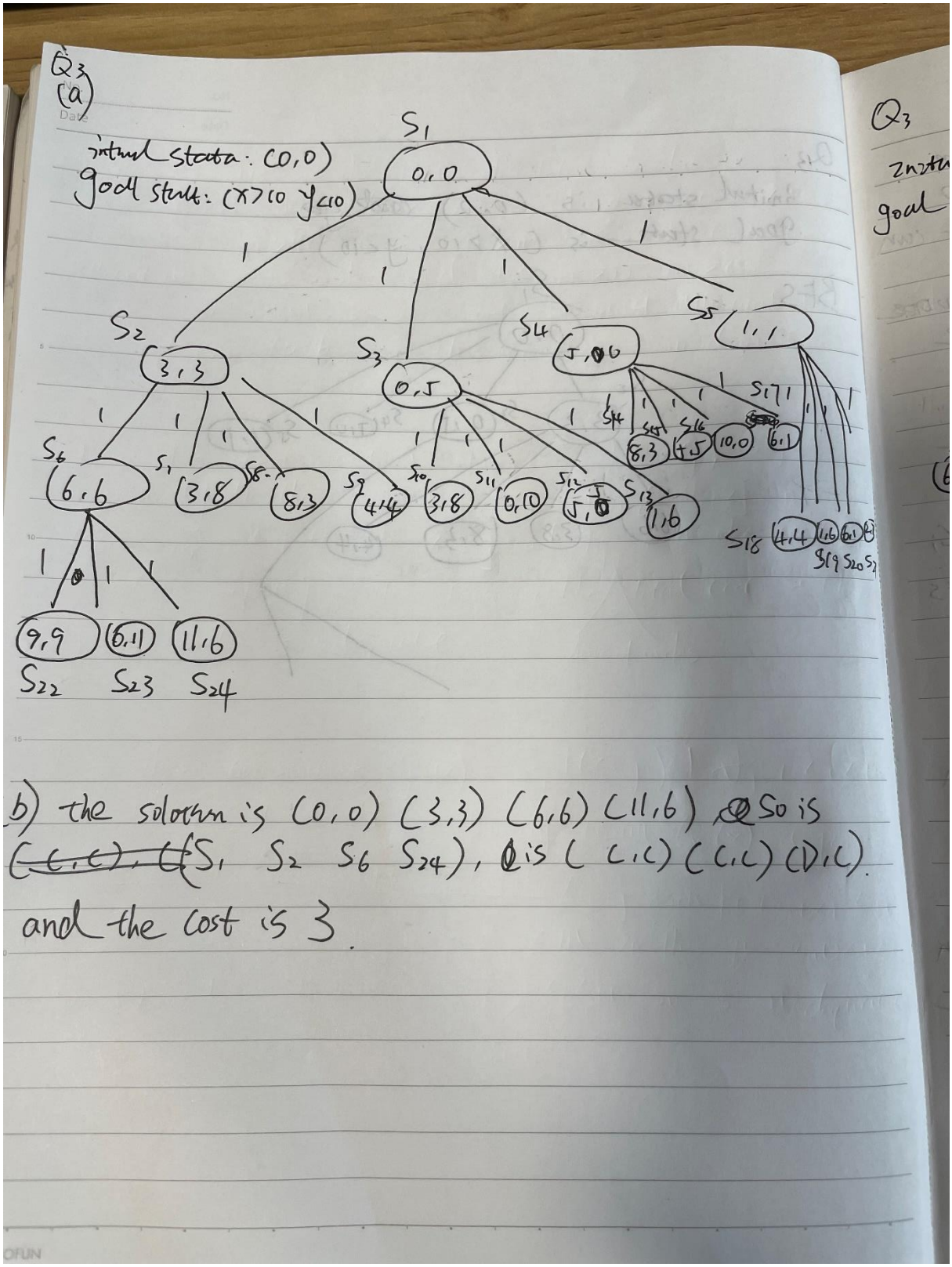
	X_1	X_2
X_3	1	1
X_4	1	1

~~Loss~~

1NN = 0

leave one-out

= Postive.



b) the solution is (0,0) (3,3) (6,6) (11,6) So is (S1 S2 S6 S24), Q is (C,C) (C,C) (D,C).

and the cost is 3.

Q4

Date

(a) This variable of this problem formulation, in this question give $0 < i \leq n$ and $0 < j \leq m$, where $n > 0$ $m > 0$ contains $n > m$ because $n > m$ so each contractor can allocation ~~each~~ task. ~~and also $n > 0$, $m > 0$~~ more than one but we must allocate to ~~one~~ at most one task, so this variable is inadequate.

(b) in this object function $f(x) = \sum_{i=1}^{n} h_{xi} \times c_i$, is good corresponding to the size n, $x_i \leq n$ ~~and the $0 < j \leq m$~~ h_{xi} is corresponding to the $x_i = j$ and h_j. and the cost c_i is also corresponding to the minimum the total cost so this objective function is adequate. hour of works

(c) in this constraints $g_i(x) = \sum_{i=1}^{n} 1(x_i = j) = 1 \; \forall j, 0 < i \leq m$ ~~we would be to add a penalty term $Q(x)$, a penalty can be added for infeasible solution~~ $x_i = j$ each Position $0 < i \leq n$ of this vector contains j, $0 \leq j \leq m$ in this question $0 < i \leq m$ $1(x_i = j)$ is 1 otherwise $= 0$ $0 < i \leq m$ so is inadequate but

Do not write below this line

Statement of good academic conduct

By submitting this assignment, I understand that I am agreeing to the following statement of good academic conduct:

- I confirm that this assignment is **my own work** and I have not worked with others in preparing this assignment.
- I confirm this assignment was written by me and is in my own words, except for any materials from published or other sources which are clearly indicated and acknowledged as such by appropriate referencing.
- I confirm that this work is not copied from any other person's work (published or unpublished), web site, book or other source, and has not previously been submitted for assessment either at the University of Birmingham or elsewhere.
- I confirm that I have not asked, or paid, others to prepare any part of this work for me.
- I confirm that I have read and understood the University regulations on plagiarism (https://intranet.birmingham.ac.uk/as/registry/policy/conduct/plagiarism/index.aspx).