# CMPSC 465 Assignment 04

Shi Qiu

TOTAL POINTS

**6.42 / 40**

QUESTION 1

## P1 15 pts

### 1.1 P1.1 4.8 / 6

✓ **+ 3 pts** proved/explained 1.a correctly.

✓ **+ 3 pts** proved/explained 1.b correctly.

**+ 0 pts** No answer/Handwritten/More than 2 hours

**+ 0.6 pts** 10% points for 6 points

**+ 0 pts** Incorrect

**- 1.2** Point adjustment

### 1.2 P1.2 0.5 / 5

**+ 5 pts** proved/ explained region correctly.

**+ 3 pts** partially correct explanation of region.

**+ 0 pts** No answer/Handwritten

✓ **+ 0.5 pts** 10% points

**+ 0 pts** Incorrect

### 1.3 P1.3 0.32 / 4

**+ 4 pts** proved that $$l^*$$ is in the region $$s^*$$

**+ 2 pts** partially correct explanation of $$l^*$$ is in the region $$s^*$$.

✓ **+ 0.4 pts** 10% points

**+ 0 pts** No or wrong answer/Handrwritten

**- 0.08** Point adjustment

QUESTION 2

## P2 15 pts

### 2.1 P2.1 0 / 3

**+ 3 pts** Provided a correct explanation or proof.

✓ **+ 0.3 pts** I don't know how to answer this question.

**+ 0 pts** Wrong Answer

**- 0.6** Point adjustment

Late submission

### 2.2 P2.2 0 / 6

**+ 6 pts** Provided a correct proof.

**+ 3 pts** Provided an incomplete proof or explanation.

✓ **+ 0.6 pts** I don't know how to answer this question.

**+ 0 pts** Wrong Answer

**- 1.2** Point adjustment

Late submission

### 2.3 P2.3 0 / 6

**+ 6 pts** Provided an algorithm in $$O(n^3 \log k)$$

**+ 4 pts** Provided an algorithm in $$O(n^{\log_2 7} k)$$ ($$n^{\log_2 7}$$ may come from the optimized matrix multiplication in the textbook)

**+ 3 pts** Provided an algorithm in $$O(n^3 k)$$

**+ 3 pts** Provided an incomplete proof or explanation.

✓ **+ 0.6 pts** I don't know how to answer this question.

**+ 0 pts** Wrong Answer

**- 1.2** Point adjustment

Late submission

QUESTION 3

### 3 P3 0.8 / 10

**+ 3 pts** Described a correct way to find the uppermost and lowermost coordinates.

**+ 4 pts** Described a correct way to find the leftmost and rightmost coordinates.

**+ 3 pts** Provided a reasonable running time analysis for the algorithm, and it runs in $O(\log (m + n))$ or $O(\log (mn))$.

**+ 1 pts** I don't know how to answer this question.

**+ 0 pts** No answer/Handwritten/More than 2 hours

**+ 0.8** Point adjustment

partial credit: +1, 20% off as late penalty

**Problem 2**

**Points:**

a)

true:

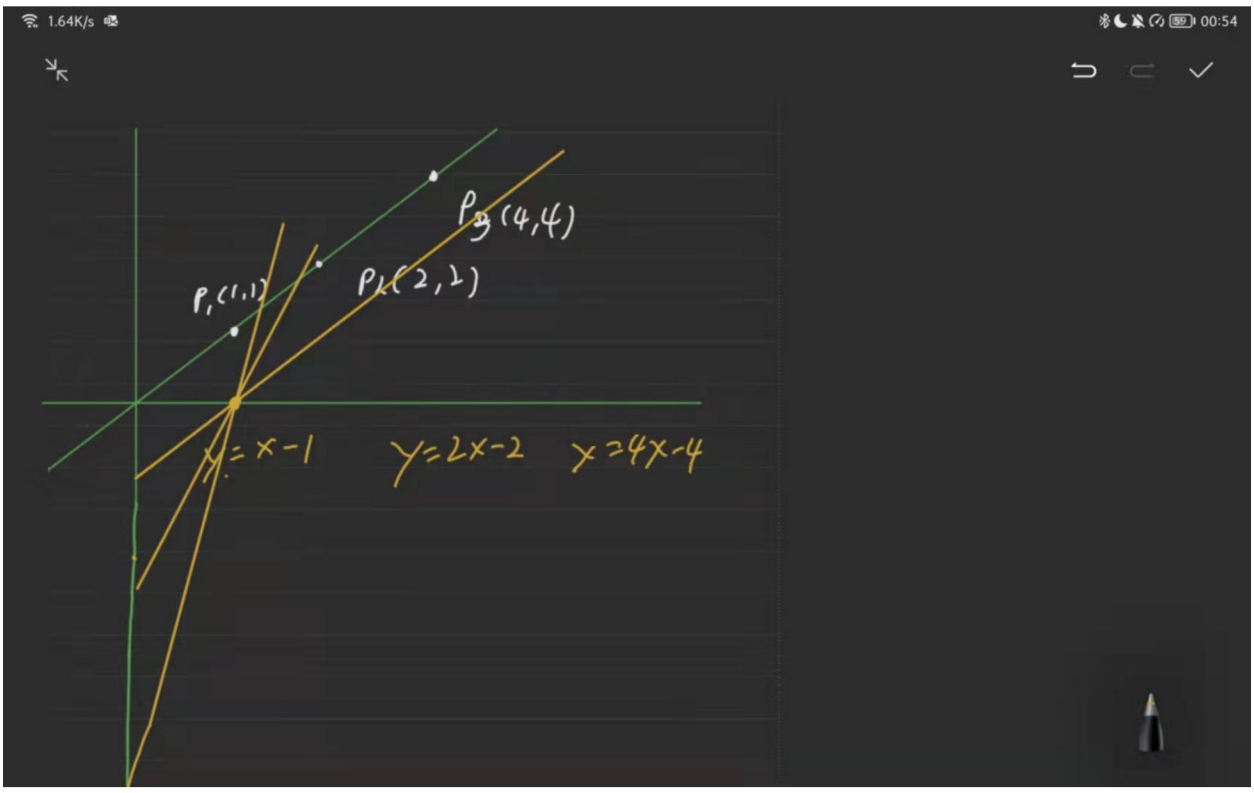
point p is on line l if and only if point lis on line p.

since p1 to pn are on the common line, their line will pass a common point

For any point p, we have (p ) = p. For any line l, we have (l ) = l.

Point p is on line l if and only if point l is on line p .

Point p is above (resp. below) line l if and only if point l is above (resp. below) line p .




b)

vise versa, if all the lines go over a point, their point will be on the same line.

2.

I don't know how to answer this question

3.

I don't know how to answer this question

1.1 P1.1 **4.8 / 6**

✓ **+ 3 pts** **proved/explained 1.a correctly.**

✓ **+ 3 pts** **proved/explained 1.b correctly.**

**+ 0 pts** No answer/Handwritten/More than 2 hours

**+ 0.6 pts** 10% points for 6 points

**+ 0 pts** Incorrect

**- 1.2** **Point adjustment**

**Problem 2**

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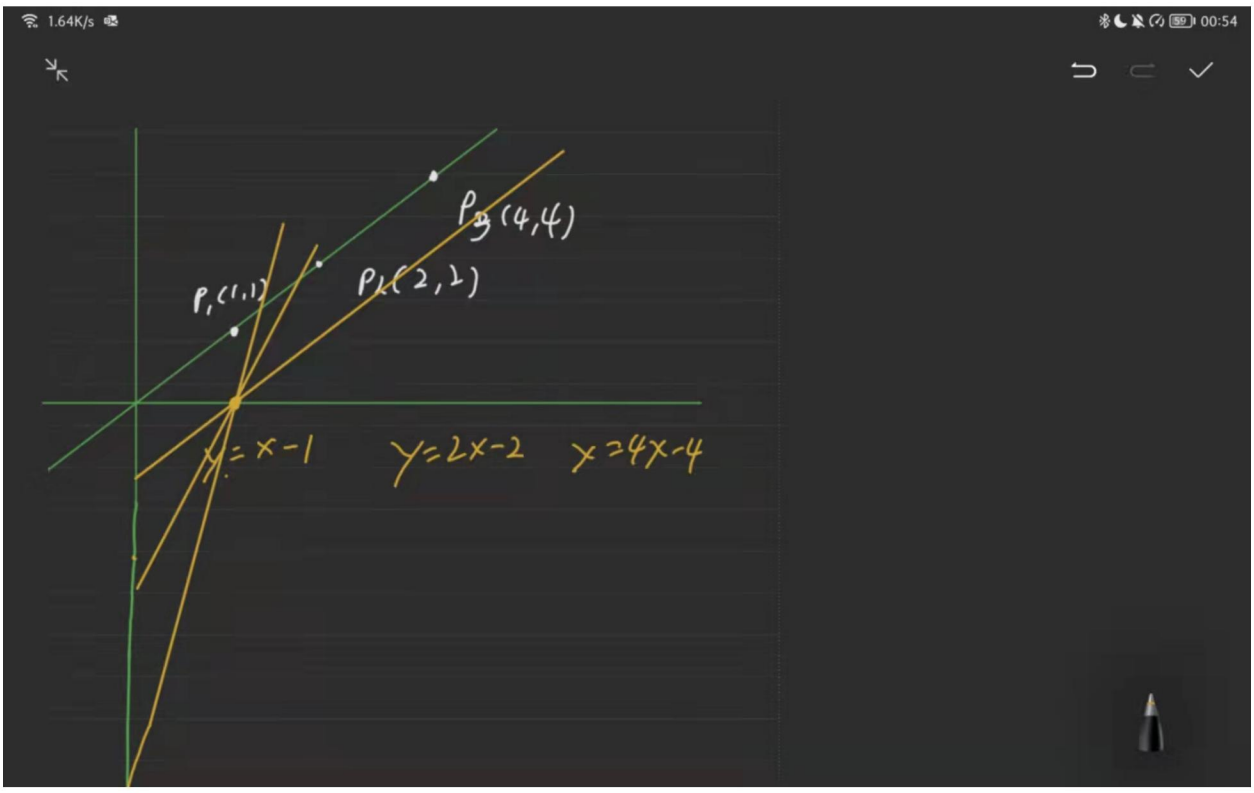


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I don't know how to answer this question

1.2 P1.2 **0.5 / 5**

+ **5 pts** proved/ explained region correctly.
+ **3 pts** partially correct explanation of region.
+ **0 pts** No answer/Handwritten
✓ **+ 0.5 pts** **10% points**
+ **0 pts** Incorrect

**Problem 2**

**Points:**

a)

true:

point p is on line l if and only if point lis on line p.

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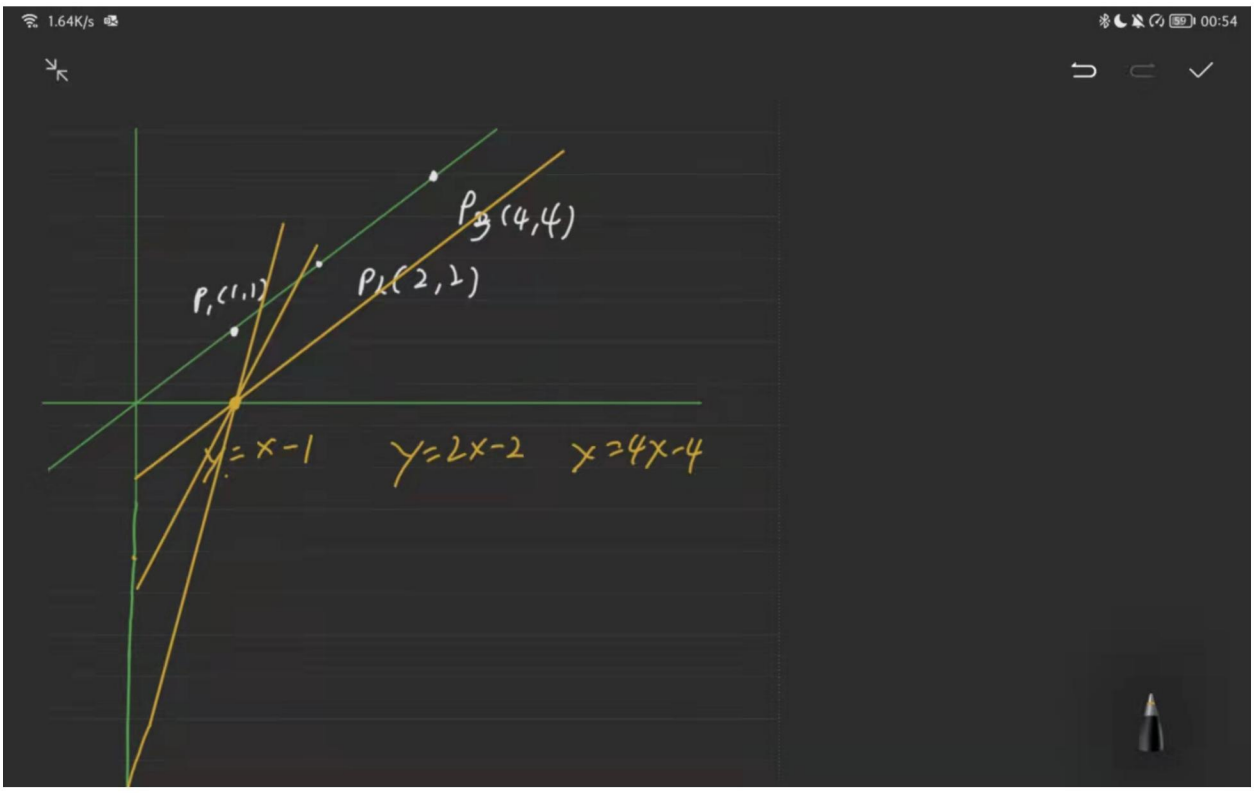


b)

vise versa, if all the lines go over a point, their point will be on the same line.

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I don't know how to answer this question

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1.3 P1.3 **0.32 / 4**

+ **4 pts** proved that $$l^*$$ is in the region $$s^*$$

+ **2 pts** partially correct explanation of $$l^*$$ is in the region $$s^*$$.

✓ **+ 0.4 pts** **10% points**

+ **0 pts** No or wrong answer/Handrwritten

**- 0.08** **Point adjustment**

**Problem 3**

**Points:**

I don't know how to answer this question

2.1 P2.1 **0 / 3**

+ **3 pts** Provided a correct explanation or proof.

✓ **+ 0.3 pts** **I don't know how to answer this question.**

+ **0 pts** Wrong Answer

**- 0.6** **Point adjustment**

Late submission

**Problem 3**

**Points:**

I don't know how to answer this question

### 2.2 P2.2 0 / 6

+ **6 pts** Provided a correct proof.

+ **3 pts** Provided an incomplete proof or explanation.

✓ **+ 0.6 pts** **I don't know how to answer this question.**

+ **0 pts** Wrong Answer

**- 1.2 Point adjustment**

Late submission

**Problem 3**

**Points:**

I don't know how to answer this question

### 2.3 P2.3 0 / 6

+ **6 pts** Provided an algorithm in $$O(n^3 \log k)$$

+ **4 pts** Provided an algorithm in $$O(n^{\log_2 7} k)$$ ($$n^{\log_2 7}$$ may come from the optimized matrix multiplication in the textbook)

+ **3 pts** Provided an algorithm in $$O(n^3 k)$$

+ **3 pts** Provided an incomplete proof or explanation.

✓ **+ 0.6 pts I don't know how to answer this question.**

+ **0 pts** Wrong Answer

**- 1.2 Point adjustment**

Late submission

**Problem 4**

**Points:**

first set x1 be 0,y1 be 0, x2 be half of the n and y2 be m

so we can check if it is true, and gradually minimize the area by test if half of the remaining area will return true.

Repeatedly divide the section that may contain the item in half until you have narrowed down the possible locations to just one.

## 3 P3 0.8 / 10

+ **3 pts** Described a correct way to find the uppermost and lowermost coordinates.

+ **4 pts** Described a correct way to find the leftmost and rightmost coordinates.

+ **3 pts** Provided a reasonable running time analysis for the algorithm, and it runs in $O(\log (m + n))$ or $O(\log (mn))$.

+ **1 pts** I don't know how to answer this question.

+ **0 pts** No answer/Handwritten/More than 2 hours

**+ 0.8 Point adjustment**

partial credit: +1, 20% off as late penalty