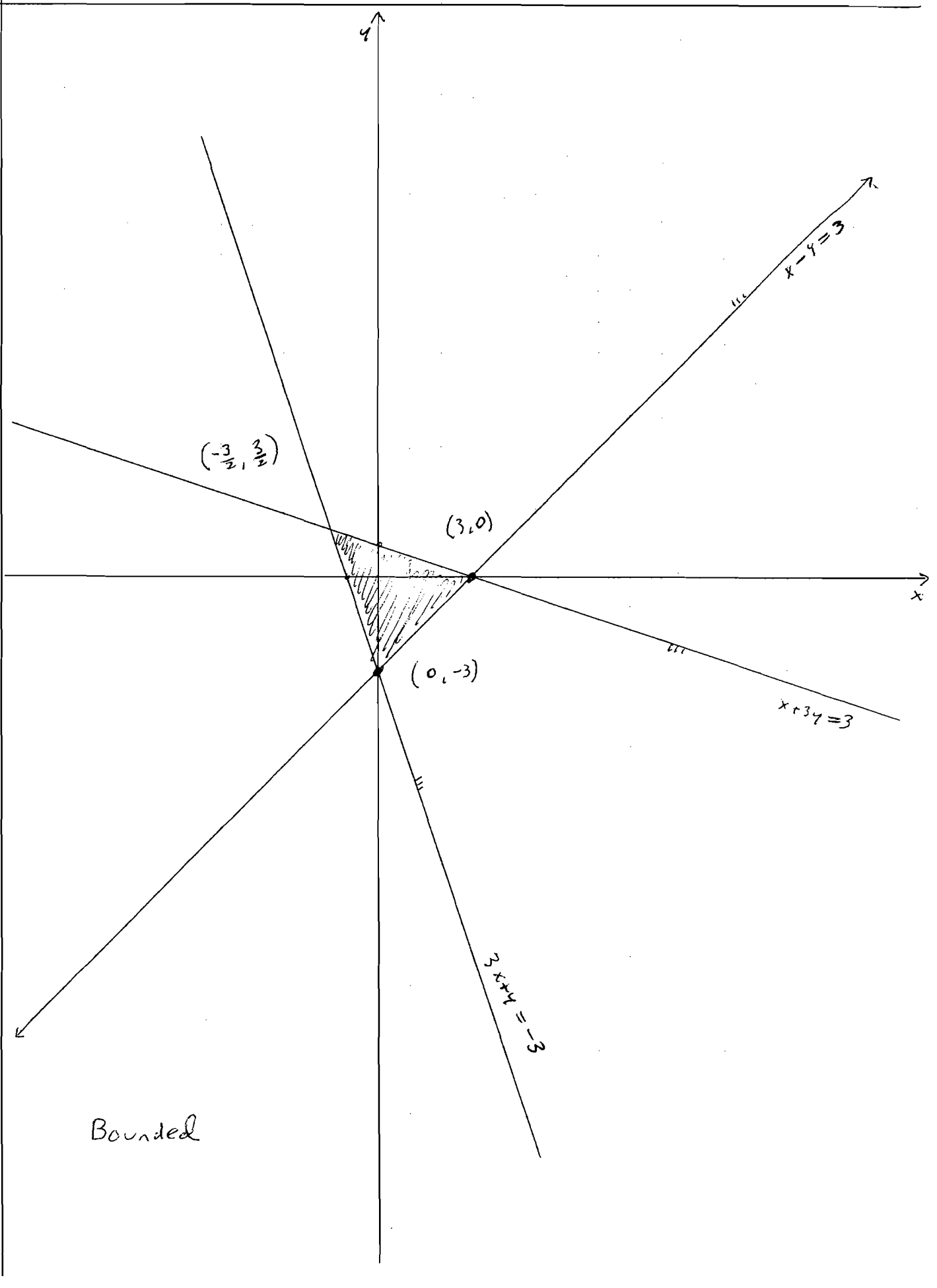
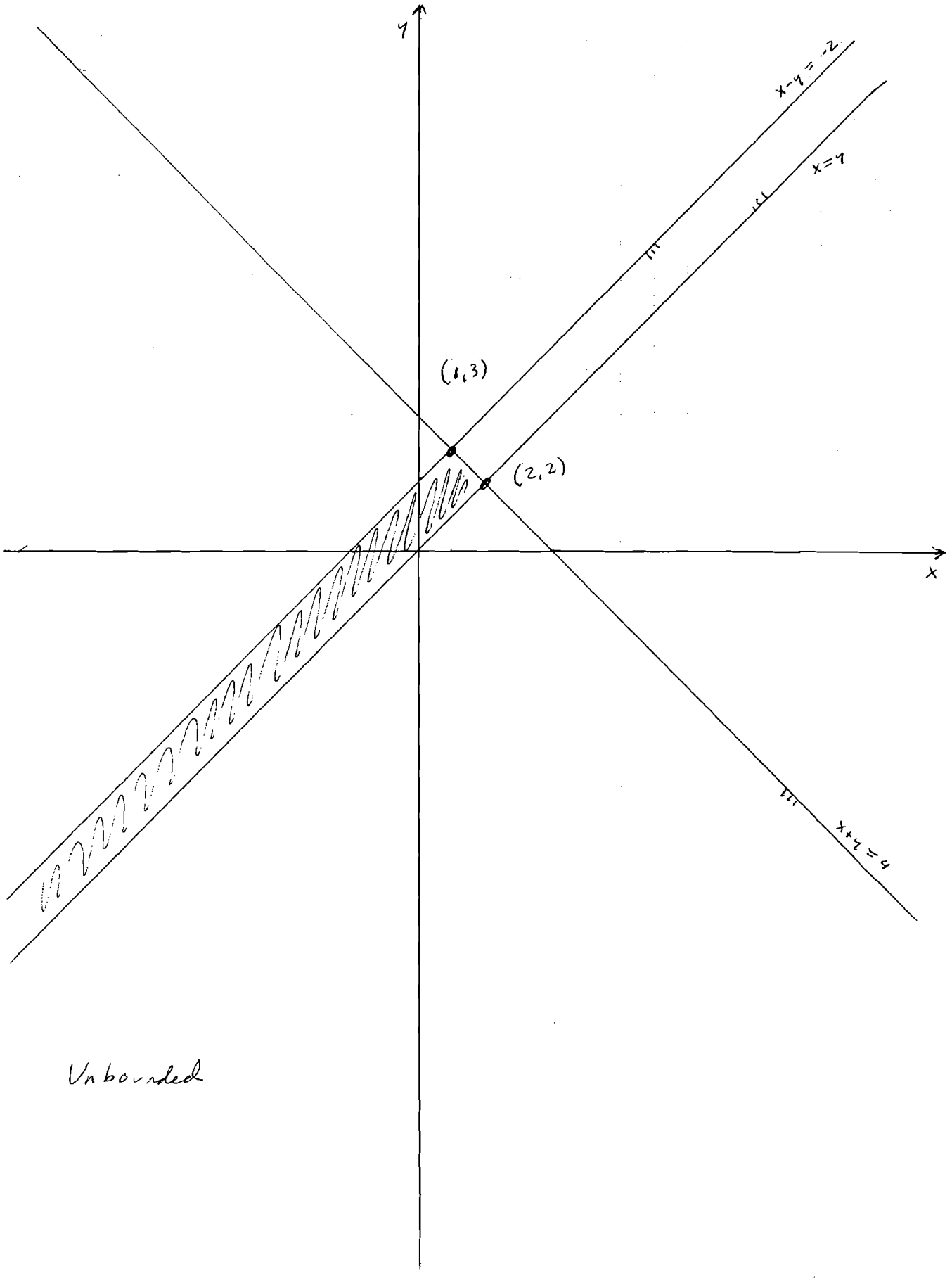
1



Bounded

Problem

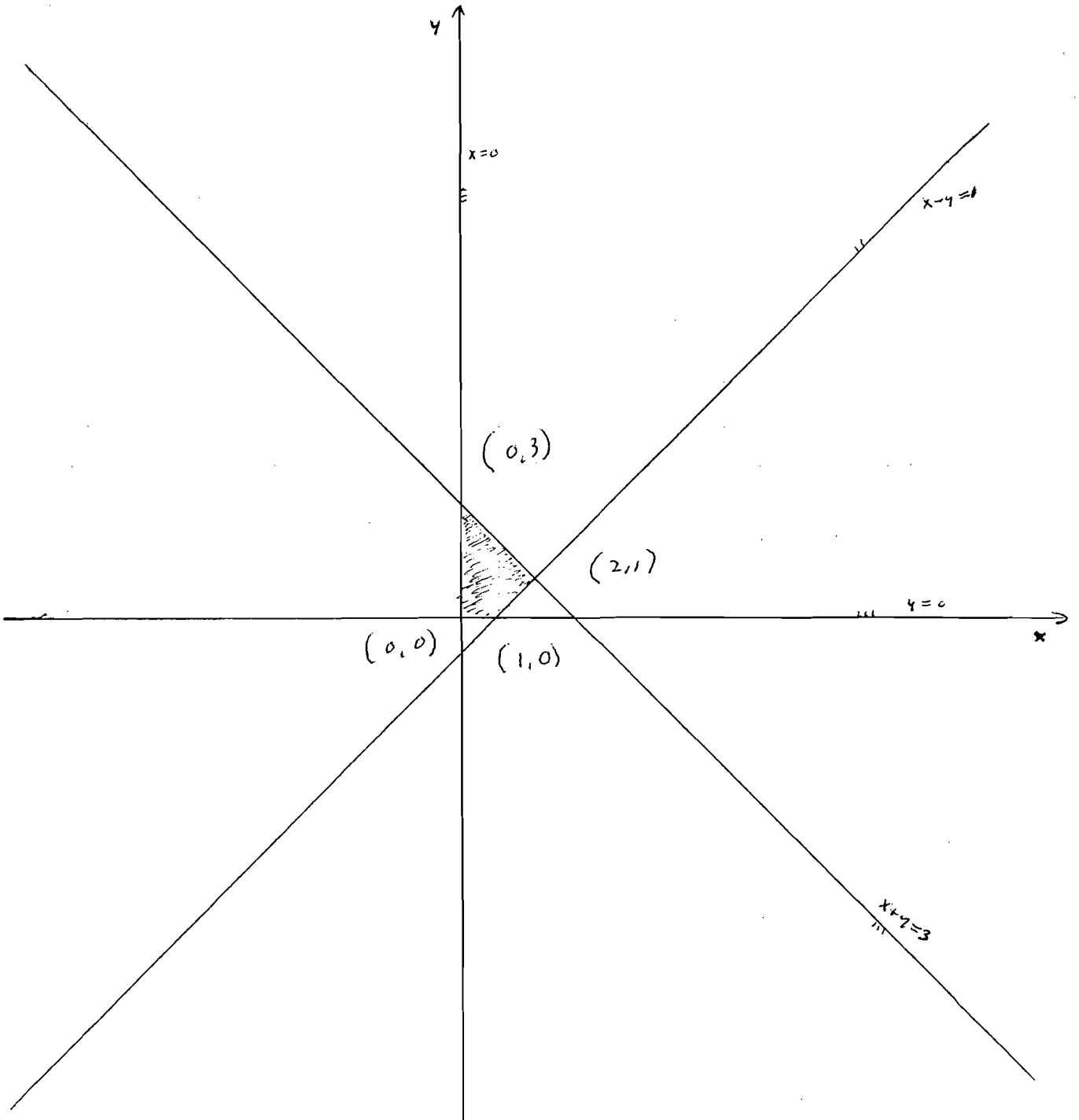
2



Unbounded

Problem

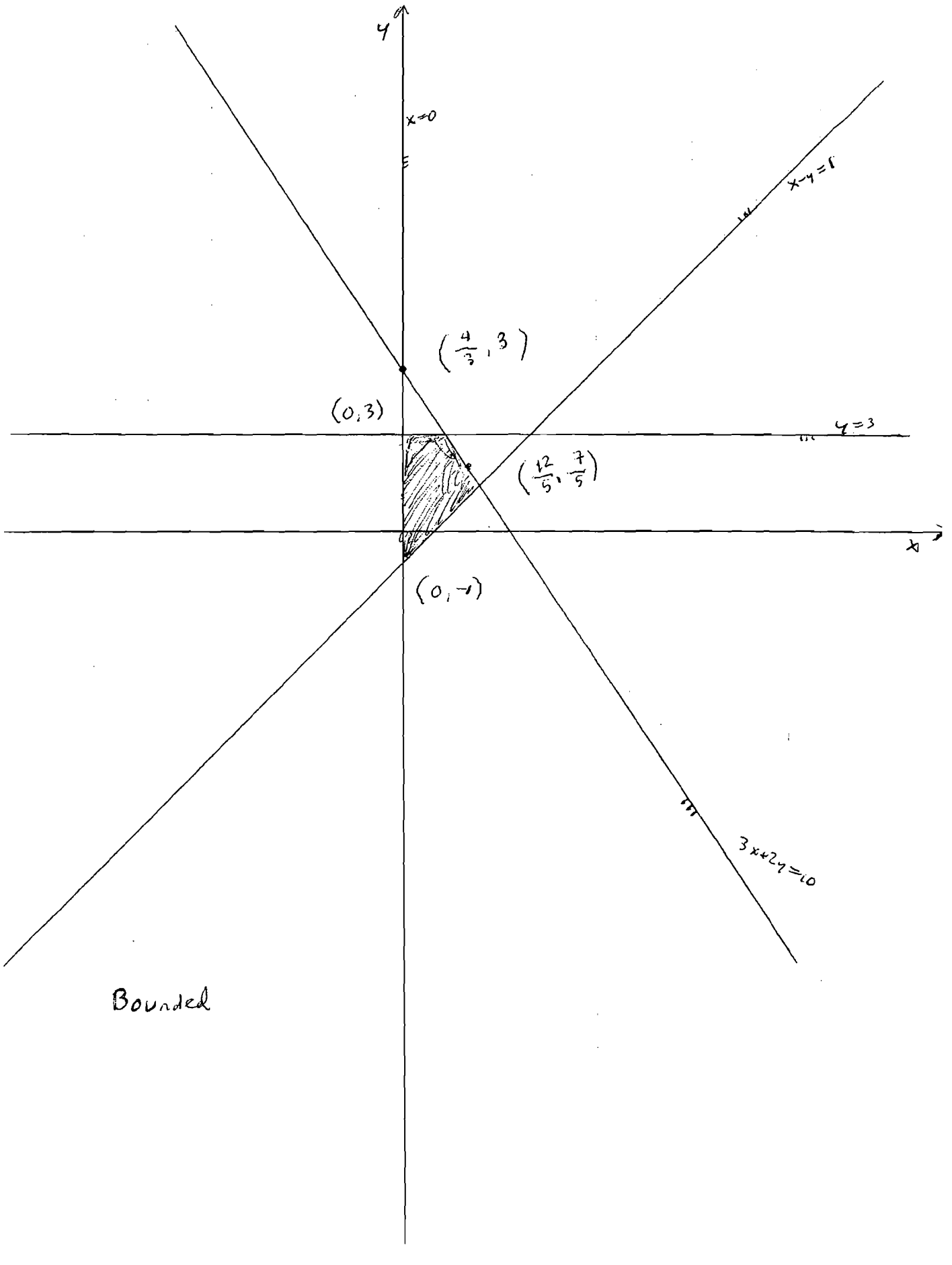
3



Bounded

Problem 4

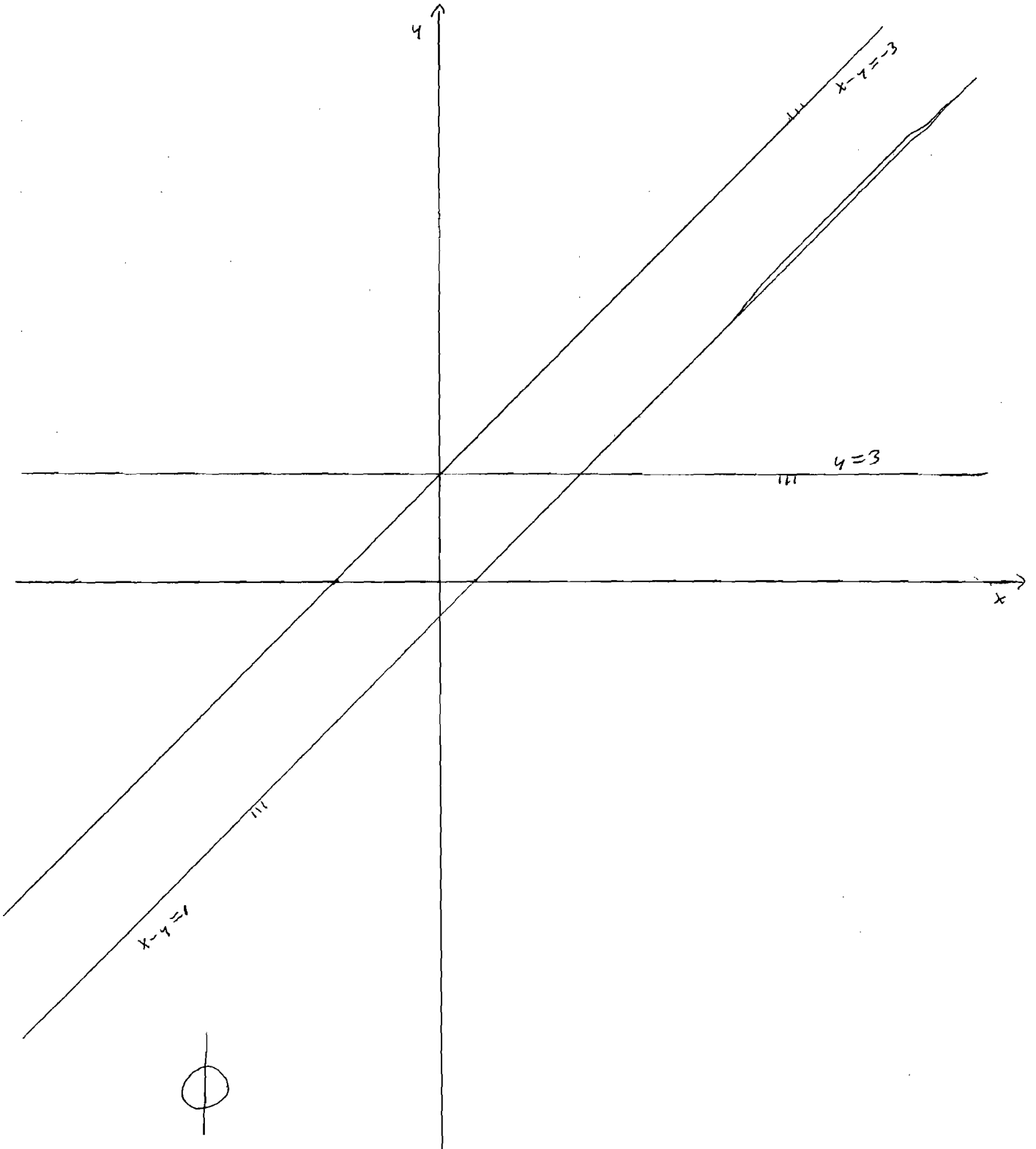
4



Bounded

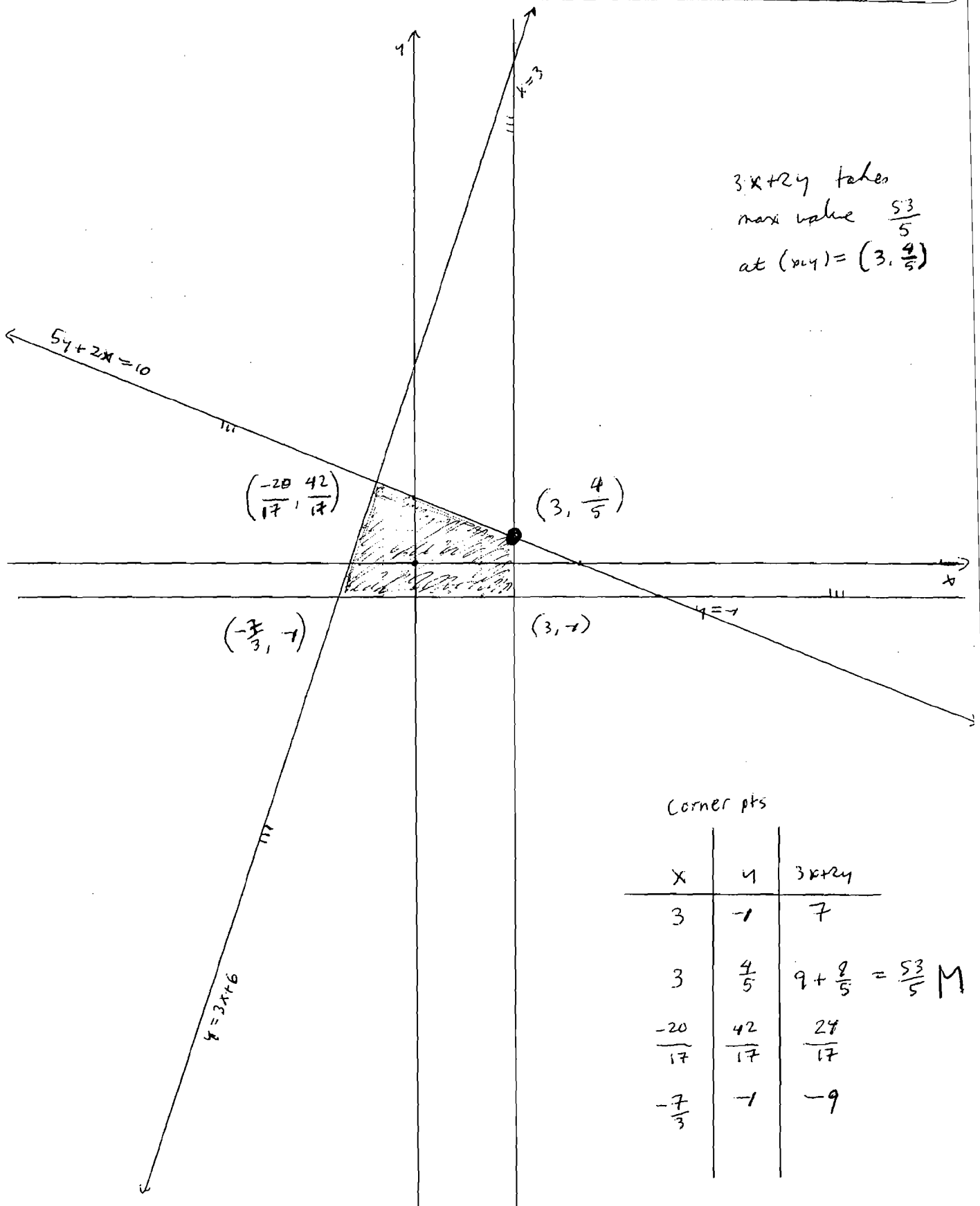
Problem

5



Problem

6



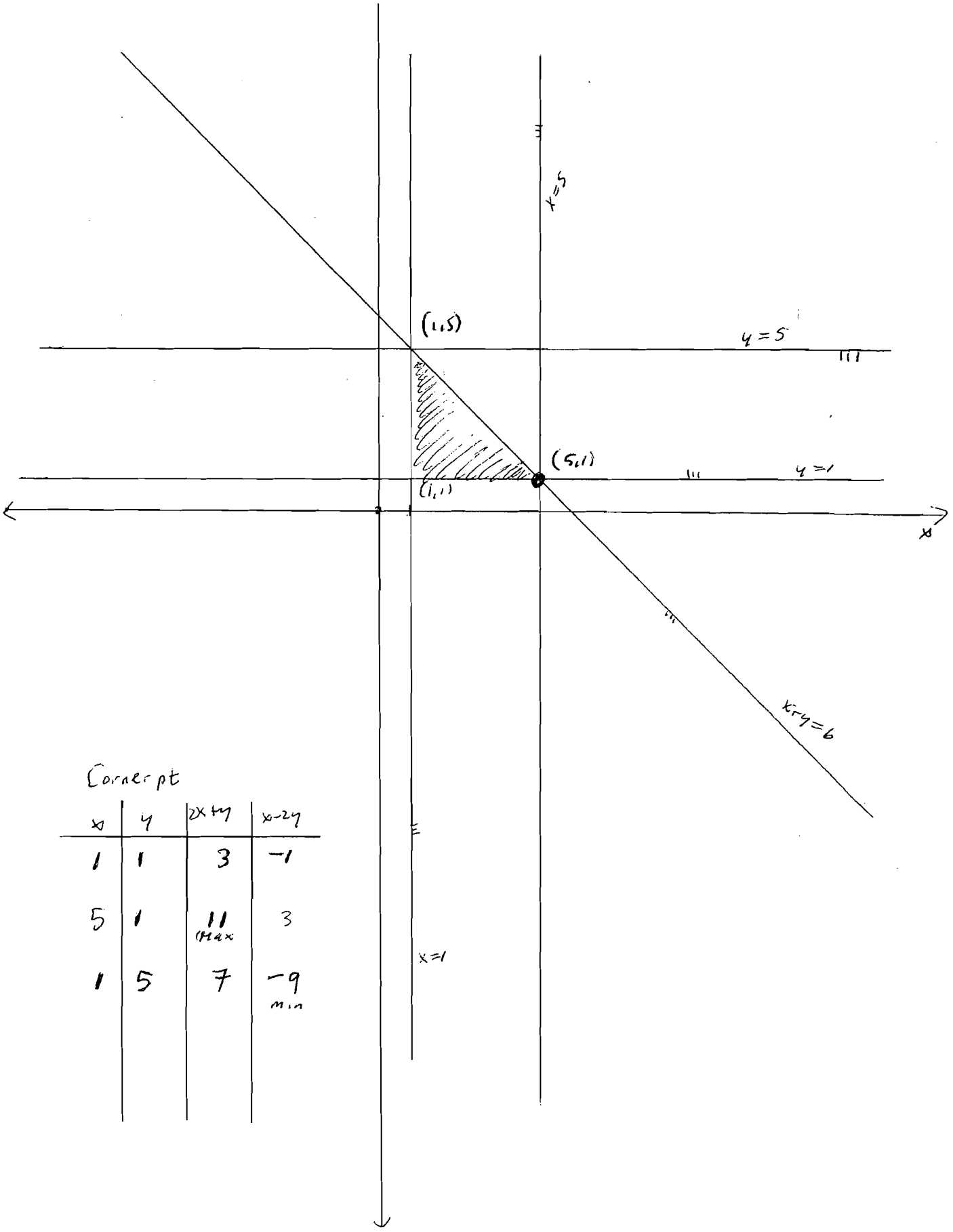
3x+2y takes max value $\frac{53}{5}$ at $(x,y) = \left(3, \frac{4}{5}\right)$

Corner pts

x	y	3x+2y
3	-1	7
3	$\frac{4}{5}$	$9 + \frac{8}{5} = \frac{53}{5}$ M
$\frac{-20}{17}$	$\frac{42}{17}$	$\frac{24}{17}$
$-\frac{7}{3}$	-1	-9

Problem

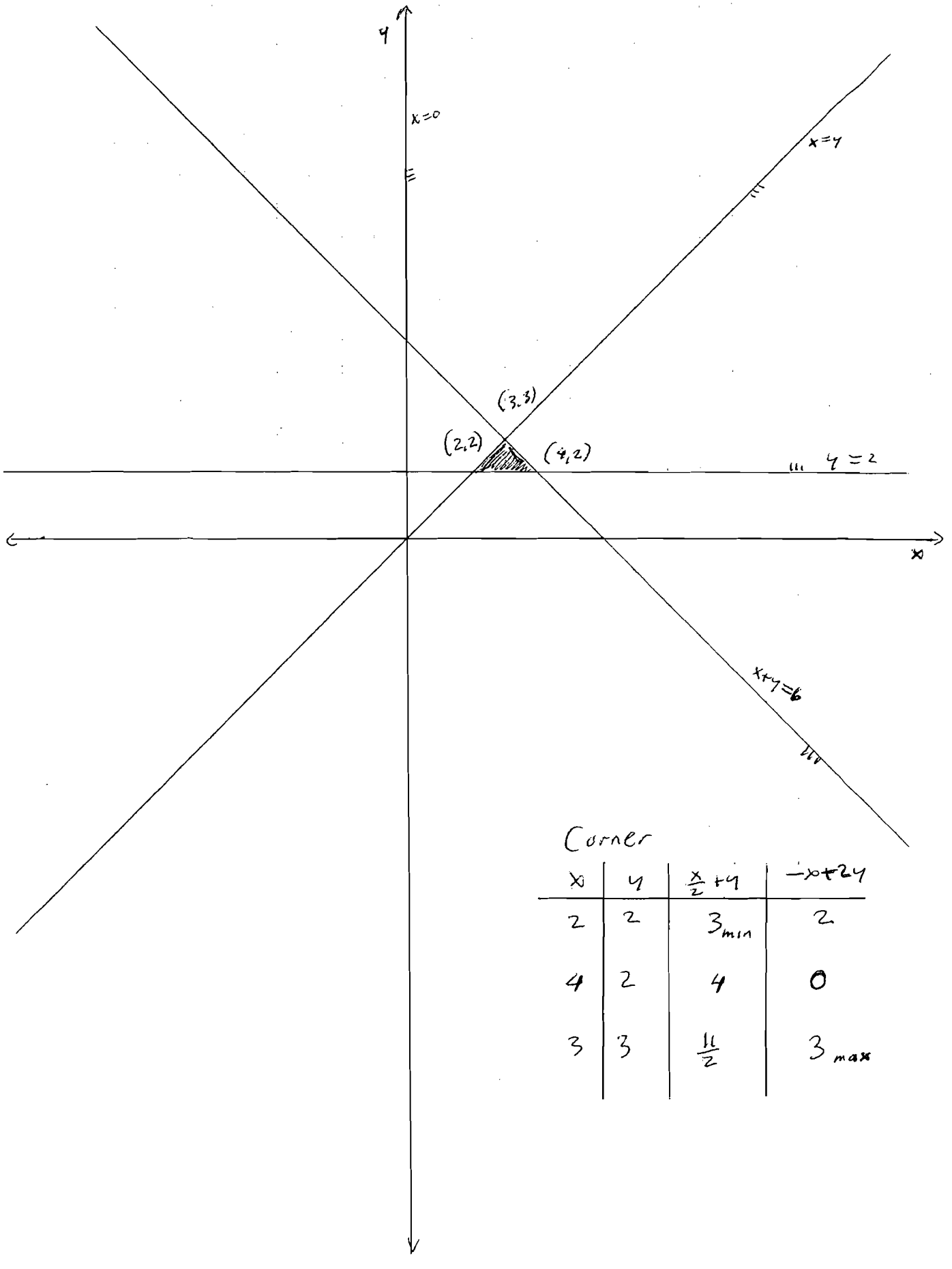
7



Corner pt

x	y	2x + y	x - 2y
1	1	3	-1
5	1	11 (Max	3
1	5	7	-9 min

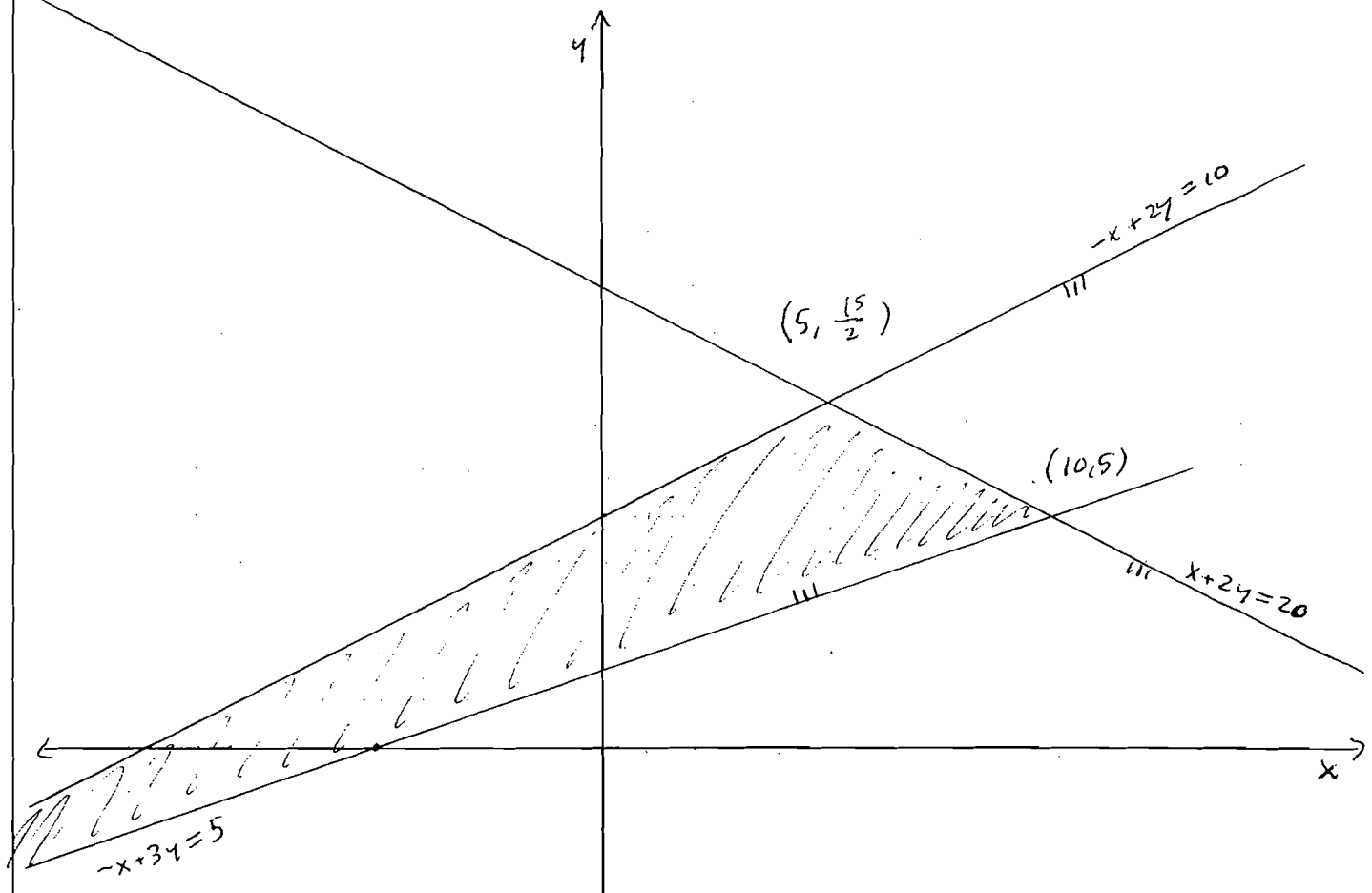
Problem 8



Corner

x	y	$\frac{x}{2}+y$	$-x+2y$
2	2	3_{min}	2
4	2	4	0
3	3	$\frac{11}{2}$	3_{max}

Problem 9



↖ intersect at $(-20, -5)$

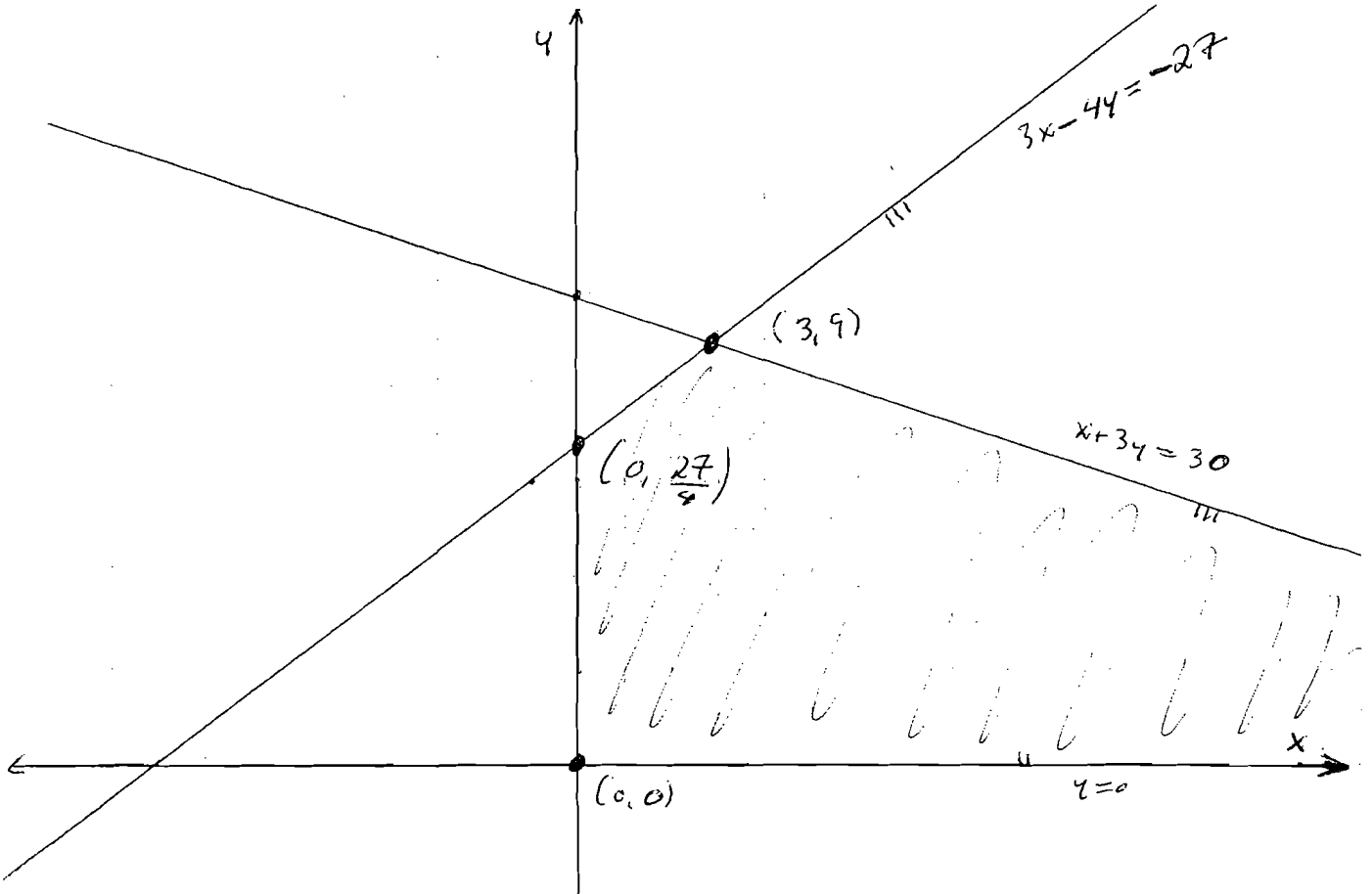
Corner

x	y	$-x+4y$
10	5	10
5	$\frac{15}{2}$	25 max
-20	-5	0 min

Problem 10

10

12



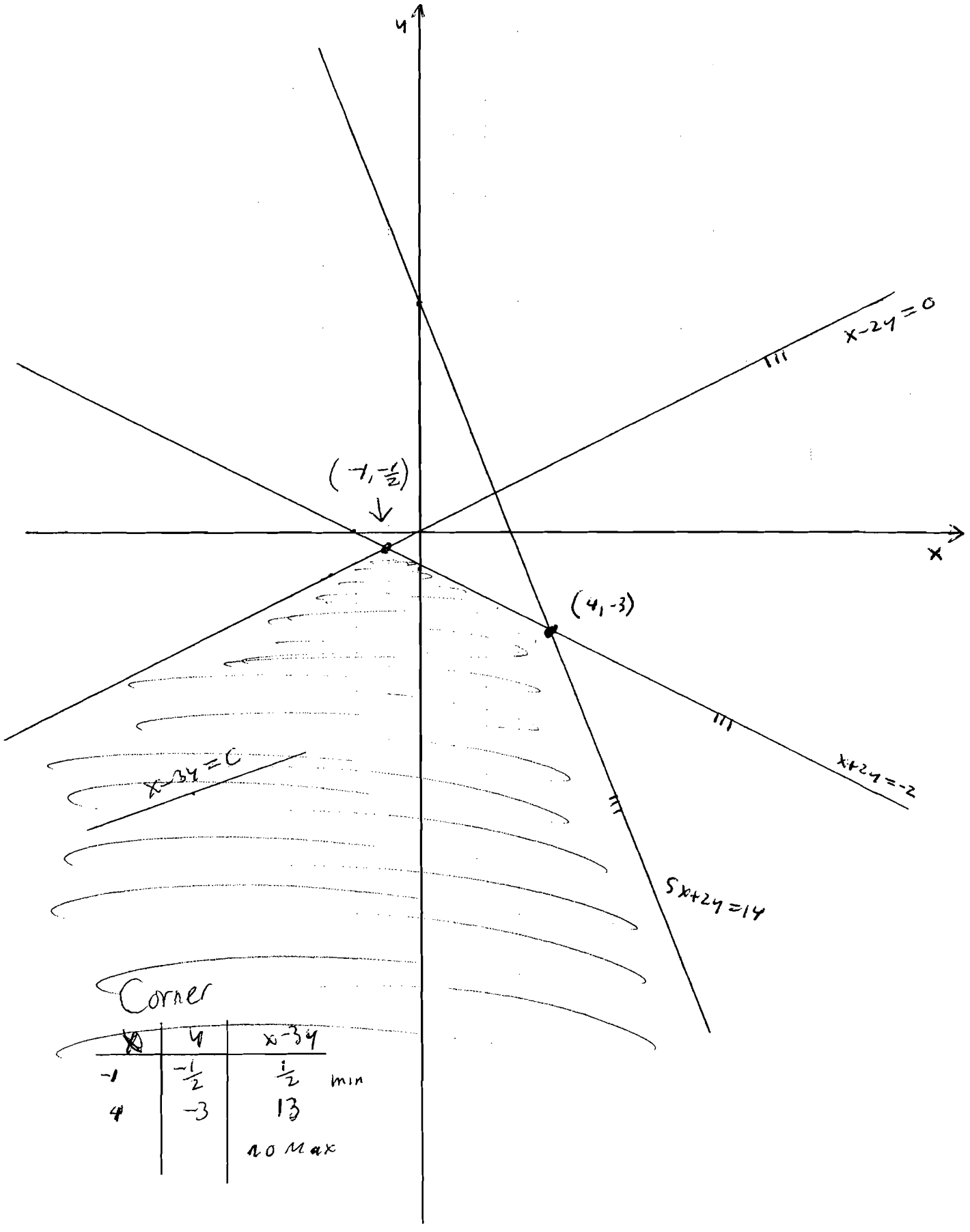
Corner pt at (30, 0)

Corner

x	y	2x − 5y	−x + 4y
0	0	0	0
30	0	60 max	−30 min
3	9	−39 min	33 max
0	27/4	−135/4	27

135/4 = 33 + 3/4

Problem 11



Corner

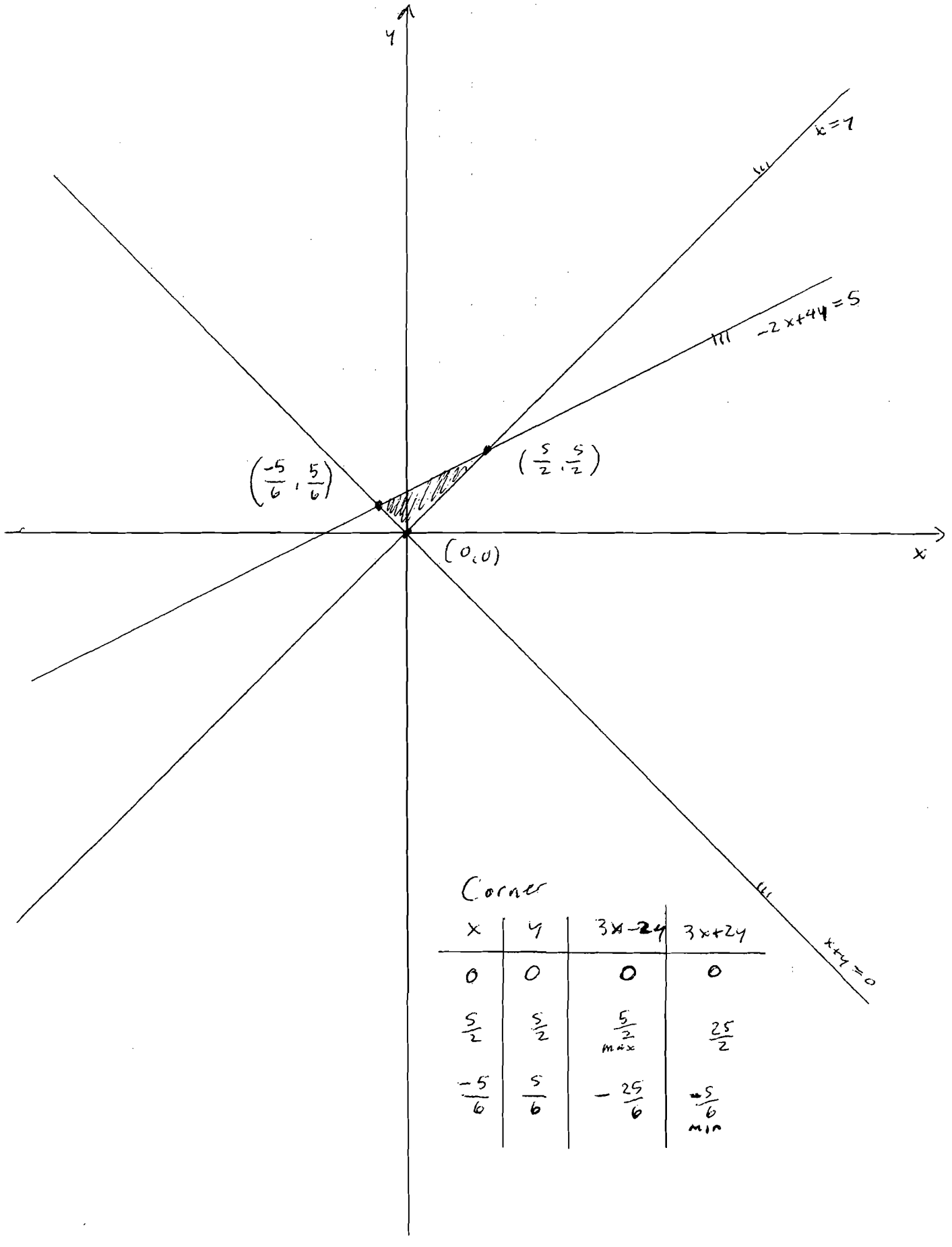
~~x~~	y	x-3y	
-1	$-\frac{1}{2}$	$\frac{1}{2}$	min
4	-3	13	
		no Max	

Problem

7.5
11.5

13

14

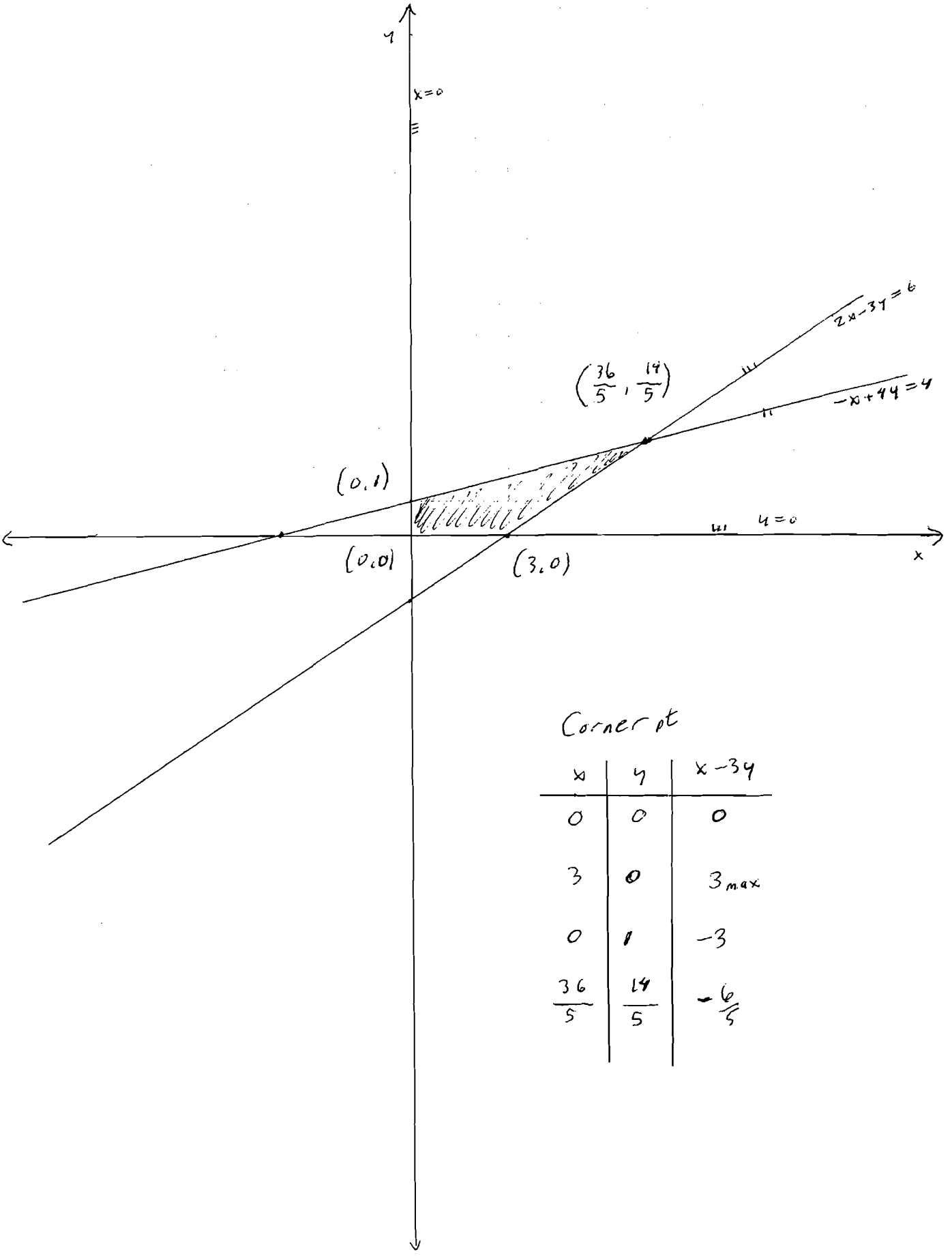


Corner

x	y	3x-2y	3x+2y
0	0	0	0
$\frac{5}{2}$	$\frac{5}{2}$	$\frac{5}{2}$ max	$\frac{25}{2}$
$\frac{-5}{6}$	$\frac{5}{6}$	$-\frac{25}{6}$	$\frac{-5}{6}$ min

Problem

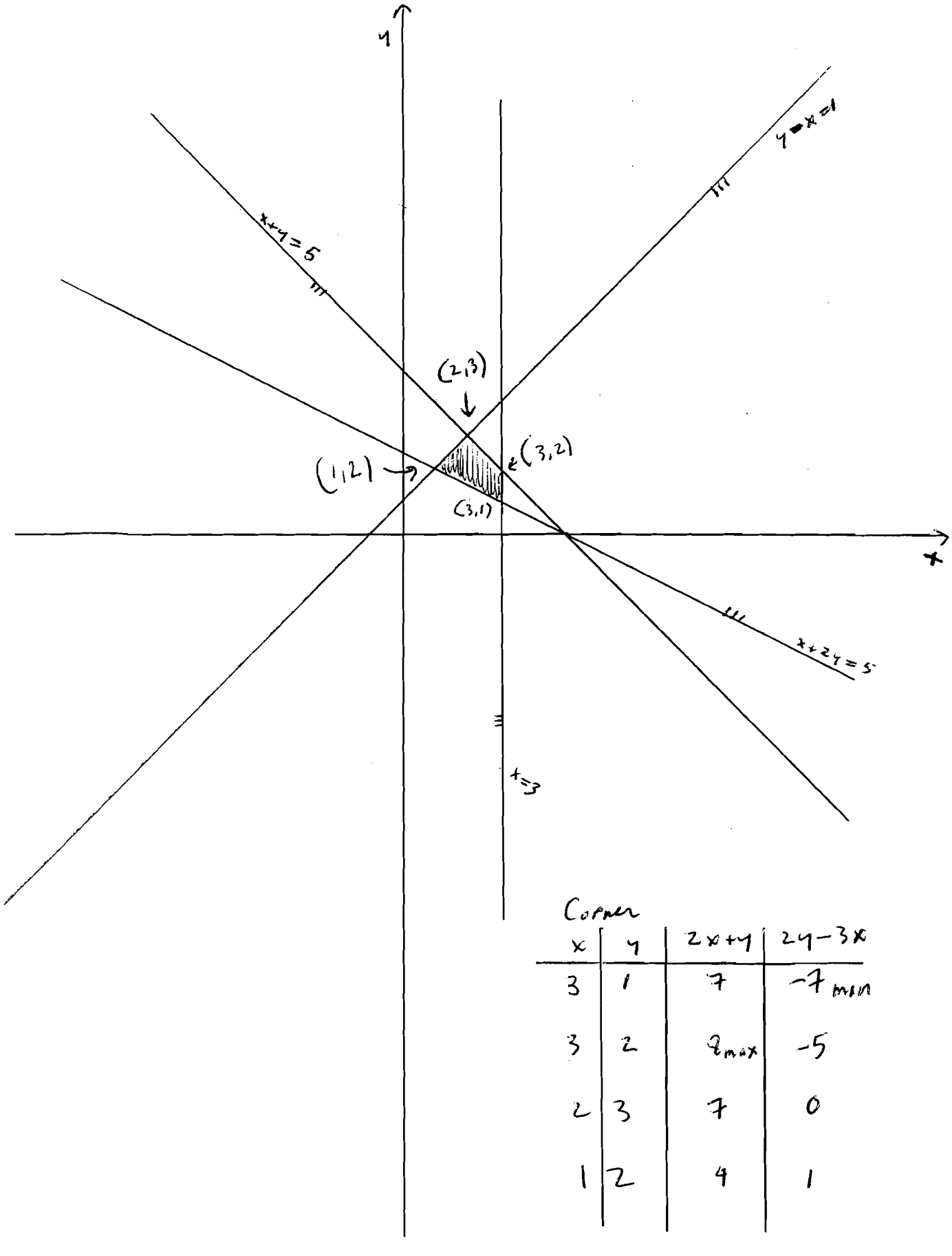
15



Corner pt

x	y	x-3y
0	0	0
3	0	3 max
0	1	-3
$\frac{36}{5}$	$\frac{14}{5}$	$-\frac{6}{5}$

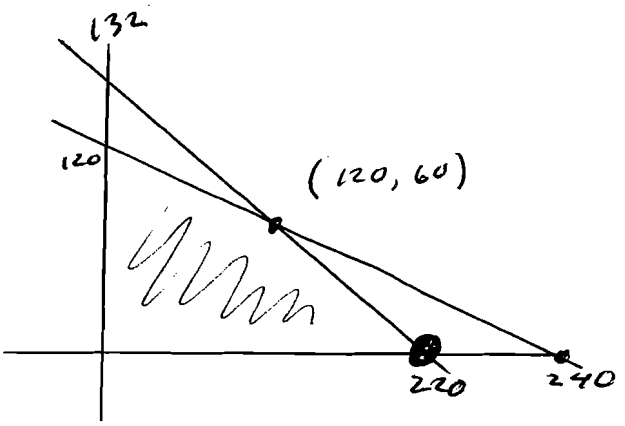
Problem 16



Corner

x	y	2x+y	2y−3x
3	1	7	−7 min
3	2	8 max	−5
2	3	7	0
1	2	4	1

Problem 17



$$6(240-2y)+10y=1320$$

$$-2y = 1320-1440 = -120$$

$$y=60$$

$$x=120$$

Corner pts

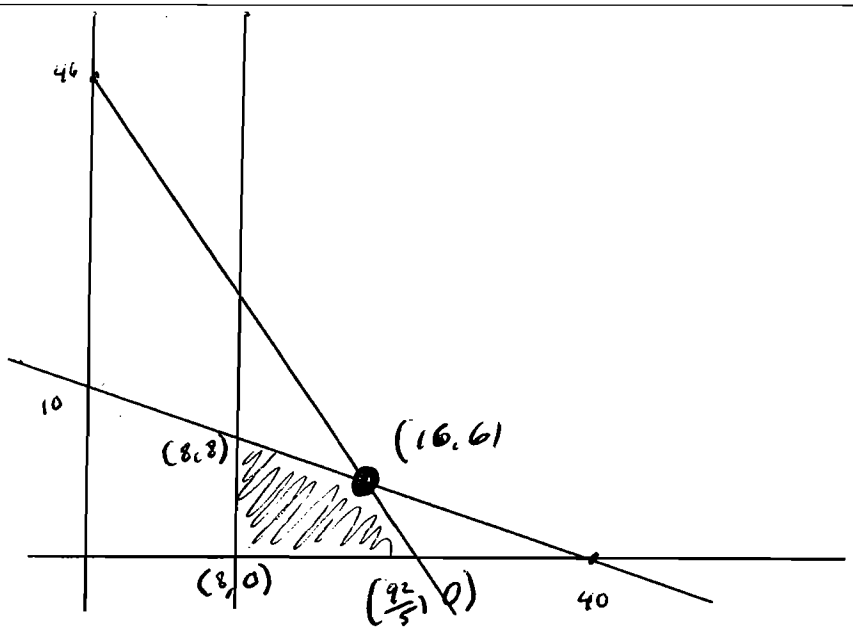
x	y	.8x + 1.2y
0	0	0
220	0	176 max
120	60	168
0	120	144

Max profit of $176 is made by making

220 small sandwiches
0 Large sandwiches

oblem

18



$.5(8) + 2y = 20$

$4 + 2y = 20$

$2y = 16 \quad y = 8$

$.5x + 2(46 - 2.5x) = 20$

$-4.5x = 20 - 92 = -72$

$x = \frac{72}{4.5} = \frac{144}{9} = 16$

$y = \frac{40 - 16}{4} = \frac{24}{4} = 6$

Corner

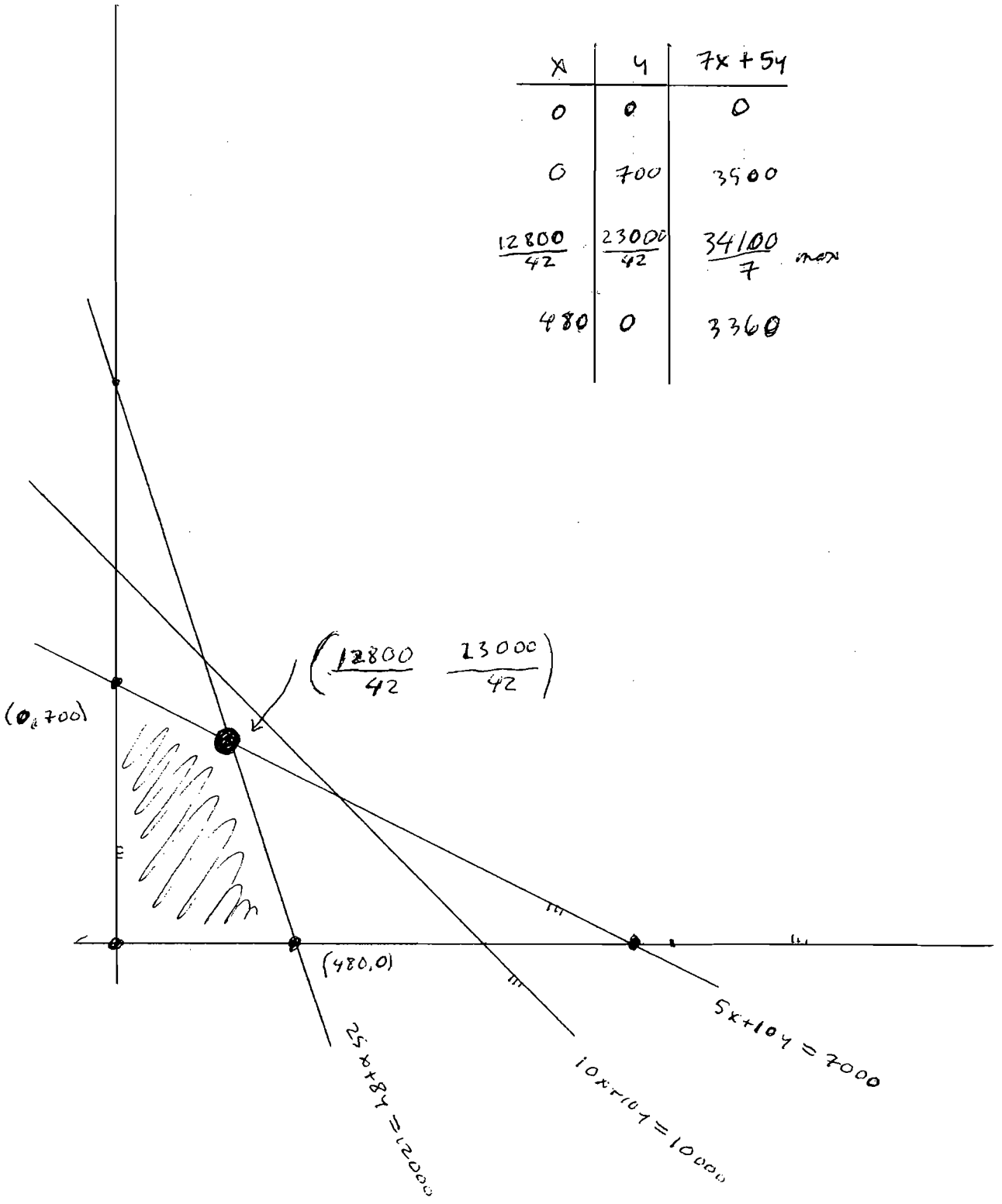
x	y	5x + 7y
8	0	40
8	8	96
16	6	122 max
$\frac{92}{5}$	0	92

Max profit 122 $

for 16 batches Salad Deluxe
6 batches Daily Special

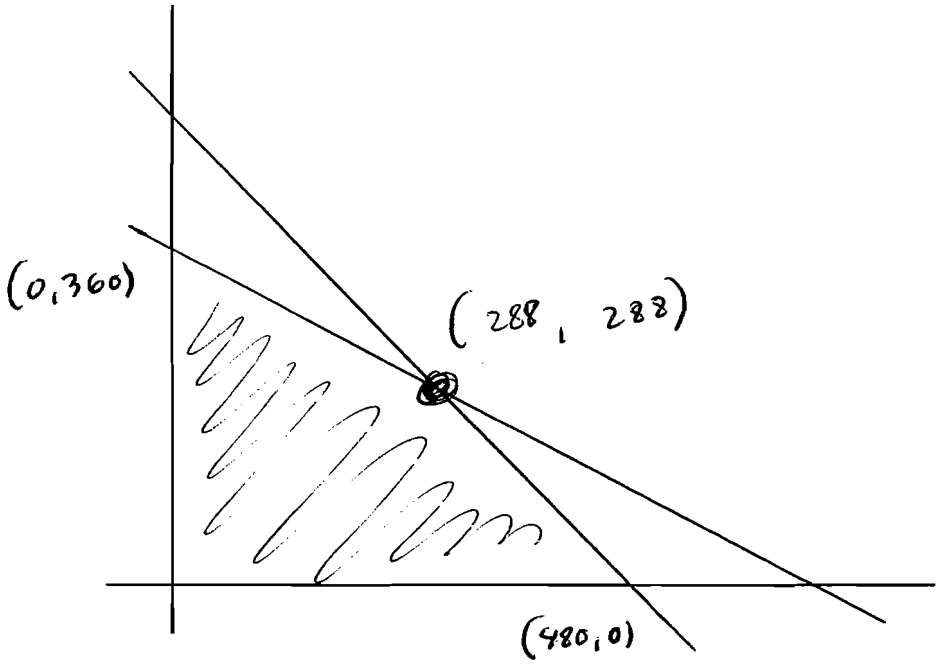
19

x	y	7x + 54
0	0	0
0	700	3500
$\frac{12800}{42}$	$\frac{23000}{42}$	$\frac{341\cancel{0}0}{7}$ max
480	0	3360



Problem

20



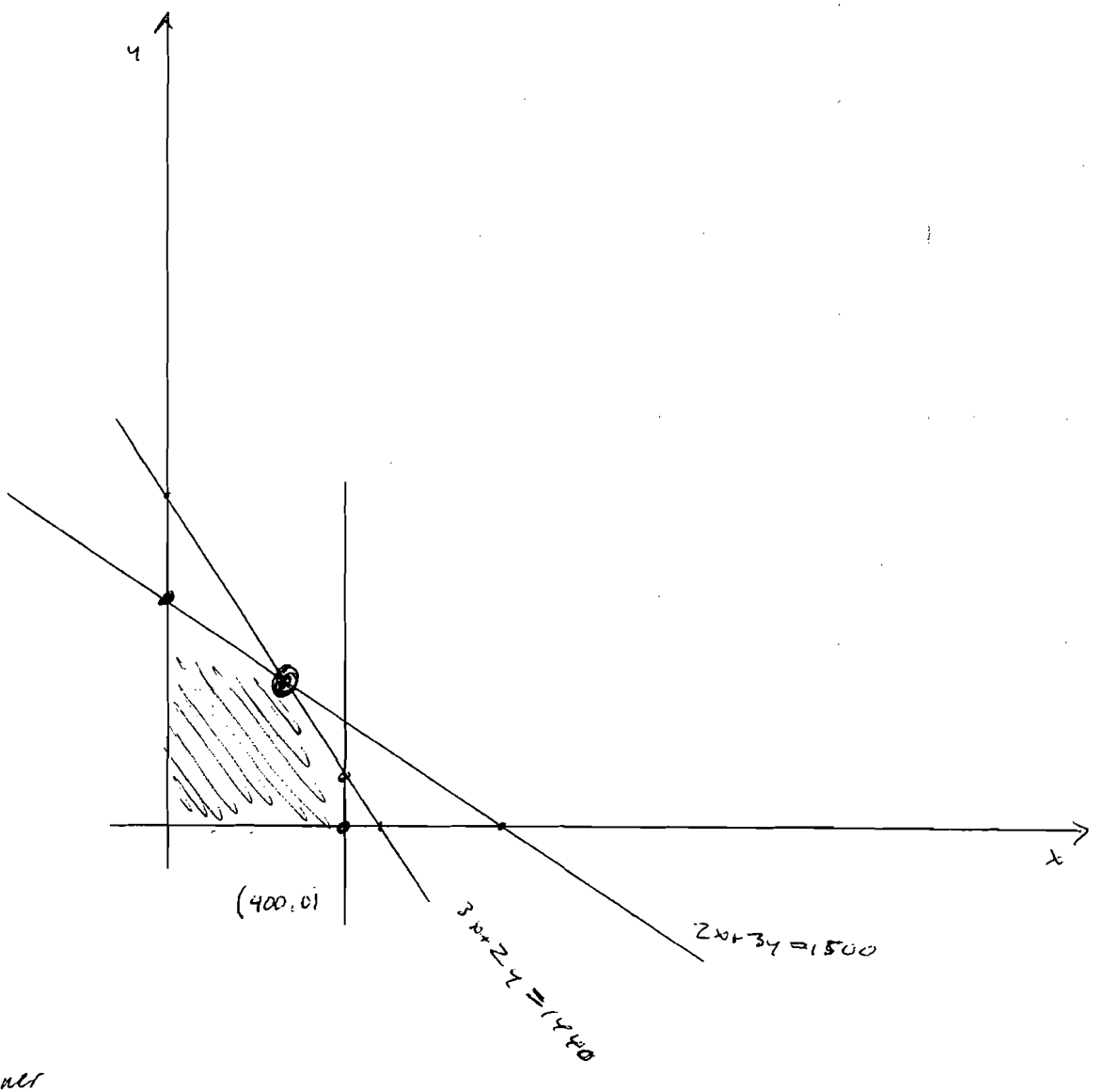
x	y	15x + 18y
480	0	7200
288	288	9504 max
0	360	6480

Max profit of 9504 for

288 Calif skates per day
288 Florida skates per day

Problem

21



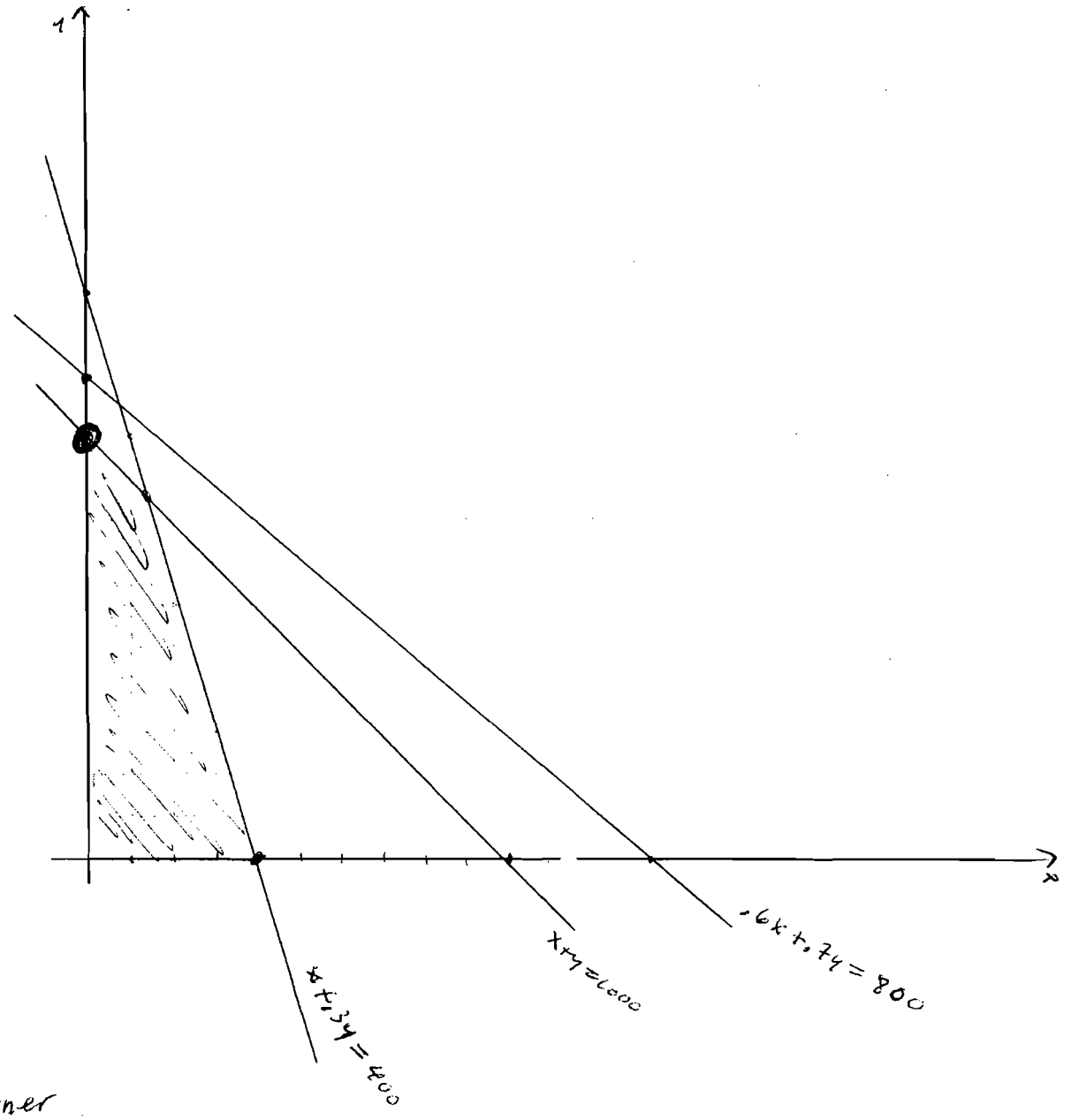
Corner x	y	20x+15y
0	0	0
400	0	8000
400	120	9800
264	324	10,140 max
0	500	7500

Max profit 10 140 $

at 264 Desks

324 Filing Cabinets

22



Corner

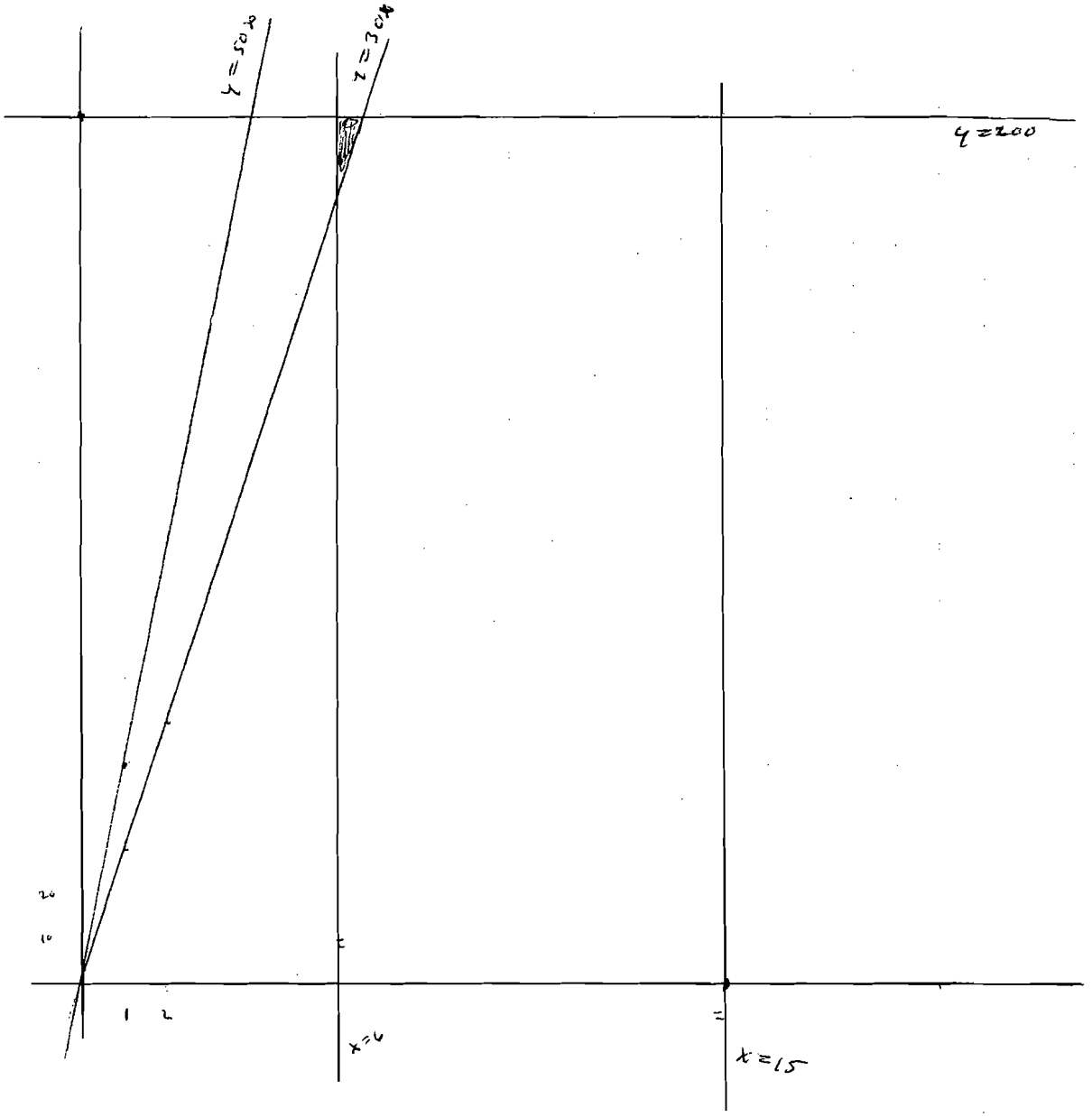
x	y	x+1.2y
0	0	0
400	0	400
0	1000	1200 max
$\frac{1000}{7}$	$\frac{6000}{7}$	$\frac{8200}{7}$ ≈1171

Max profit of 1200 $

0 gal regular

1000 gal low cal

Problem 23



x	y	$x+\frac{1}{25}y$
6	180	13.2
6	200	14
$\frac{200}{30}$	200	$\frac{44}{3} \approx 14.66$

Max info yield $\frac{44}{3}$

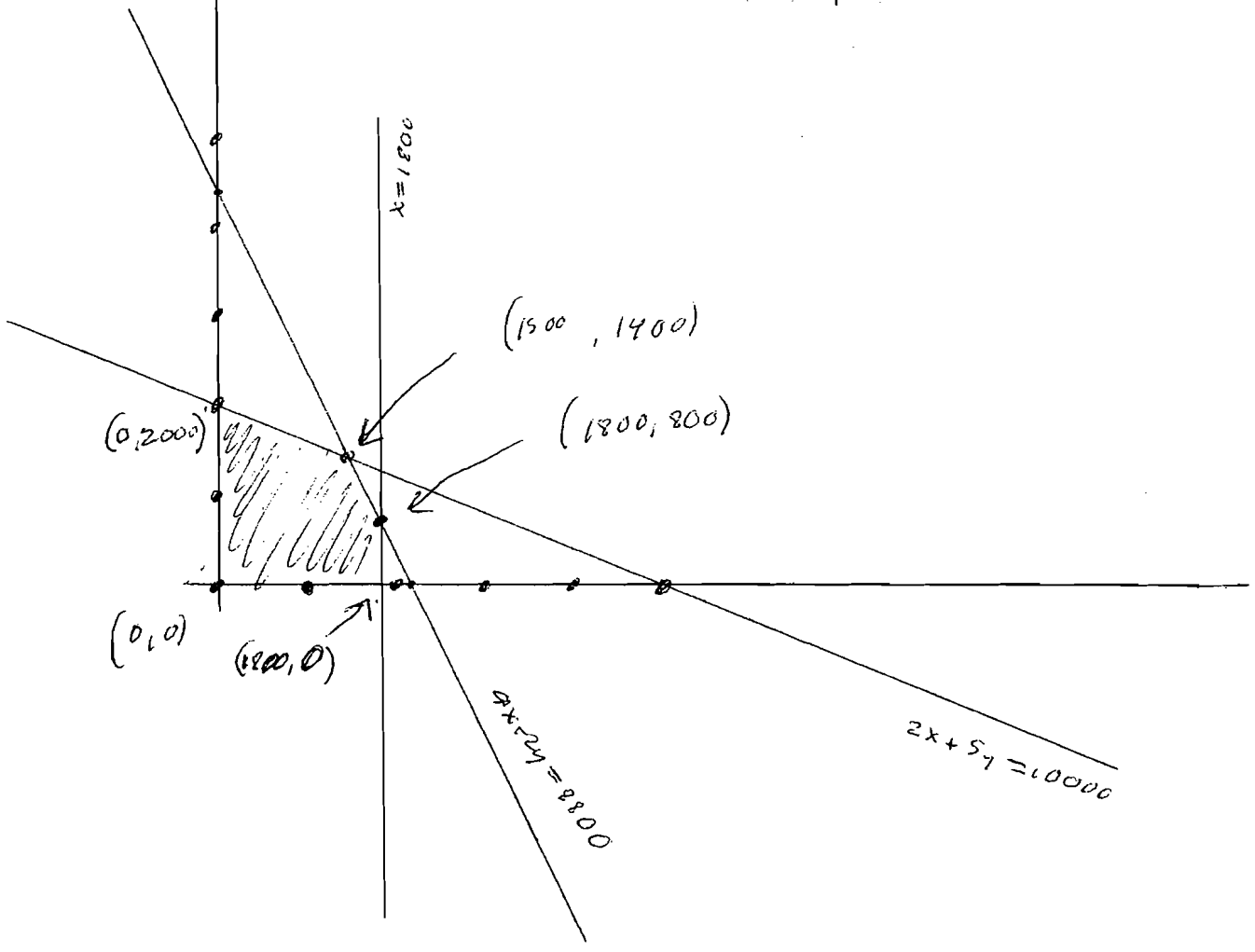
at

$\frac{20}{3}$ subject hours

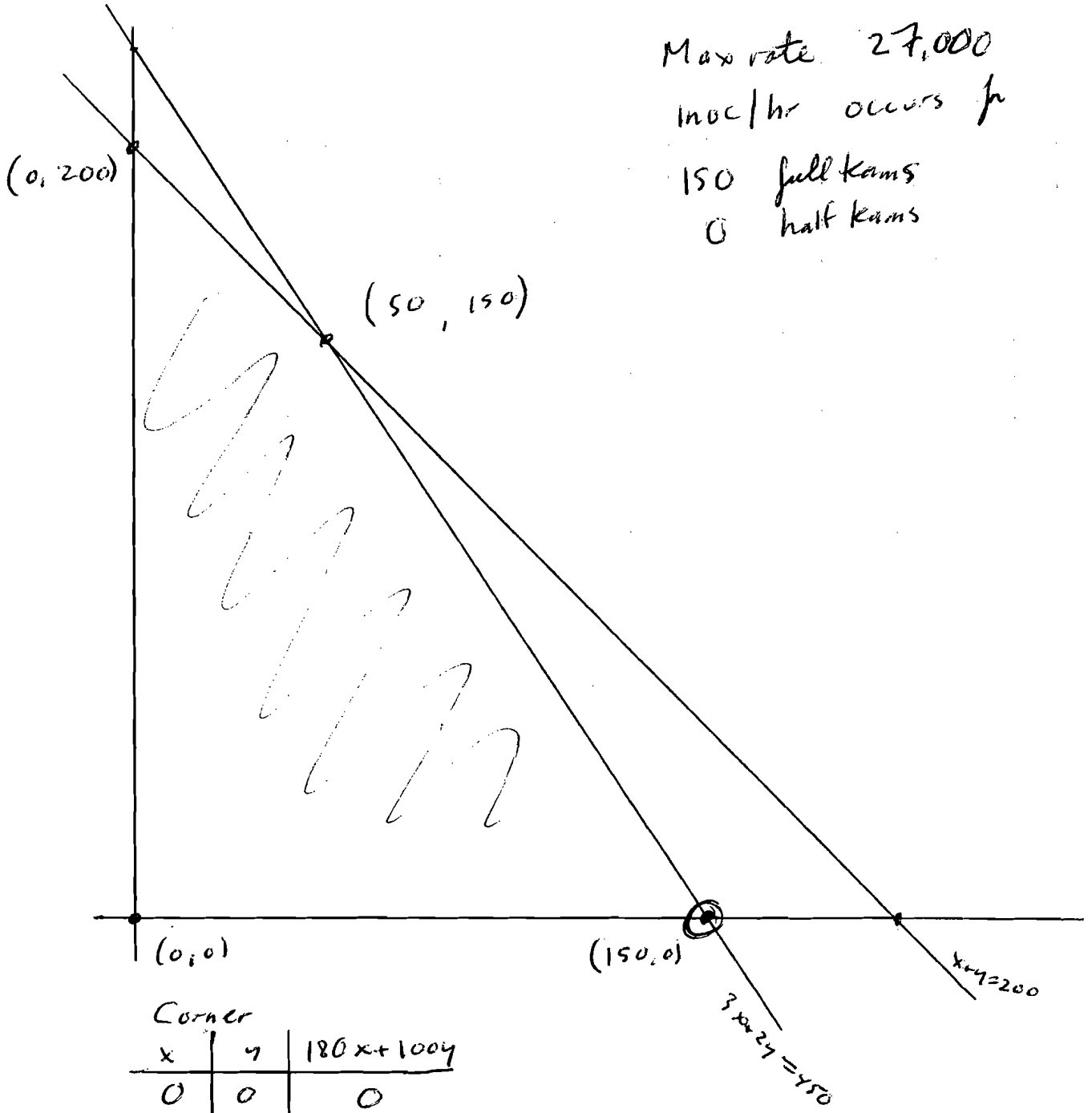
200 consultation minutes

Corner

x	y	5x+3y	
0	0	0	
1800	0	9000	
1800	800	11400	
1500	1400	11700	max
0	2000	6000	



Max Profit of $11700 for 1500 gal Extra Maple S
1400 gal regular Maple S



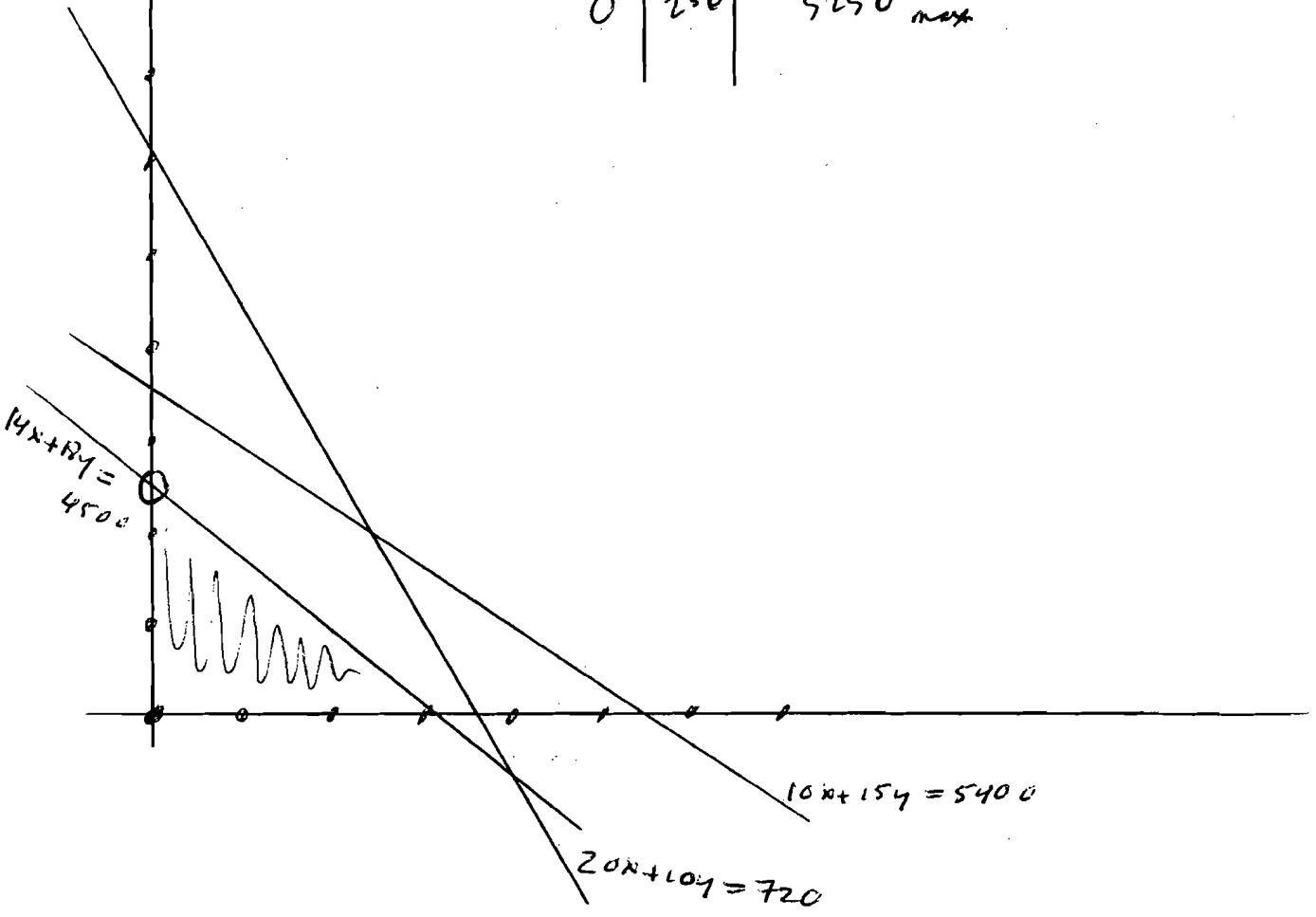
Max rate 27,000 inoc/hr occurs for
150 full kams
0 half kams

Corner x	y	180x+100y
0	0	0
150	0	27000 max
50	150	24000
0	200	20,000

26

Corner

x	y	15x + 21y
0	0	0
$\frac{4500}{14}$	0	$\frac{15}{14}$ 4500
0	250	5250 max



Max profit 5250$ occurs for

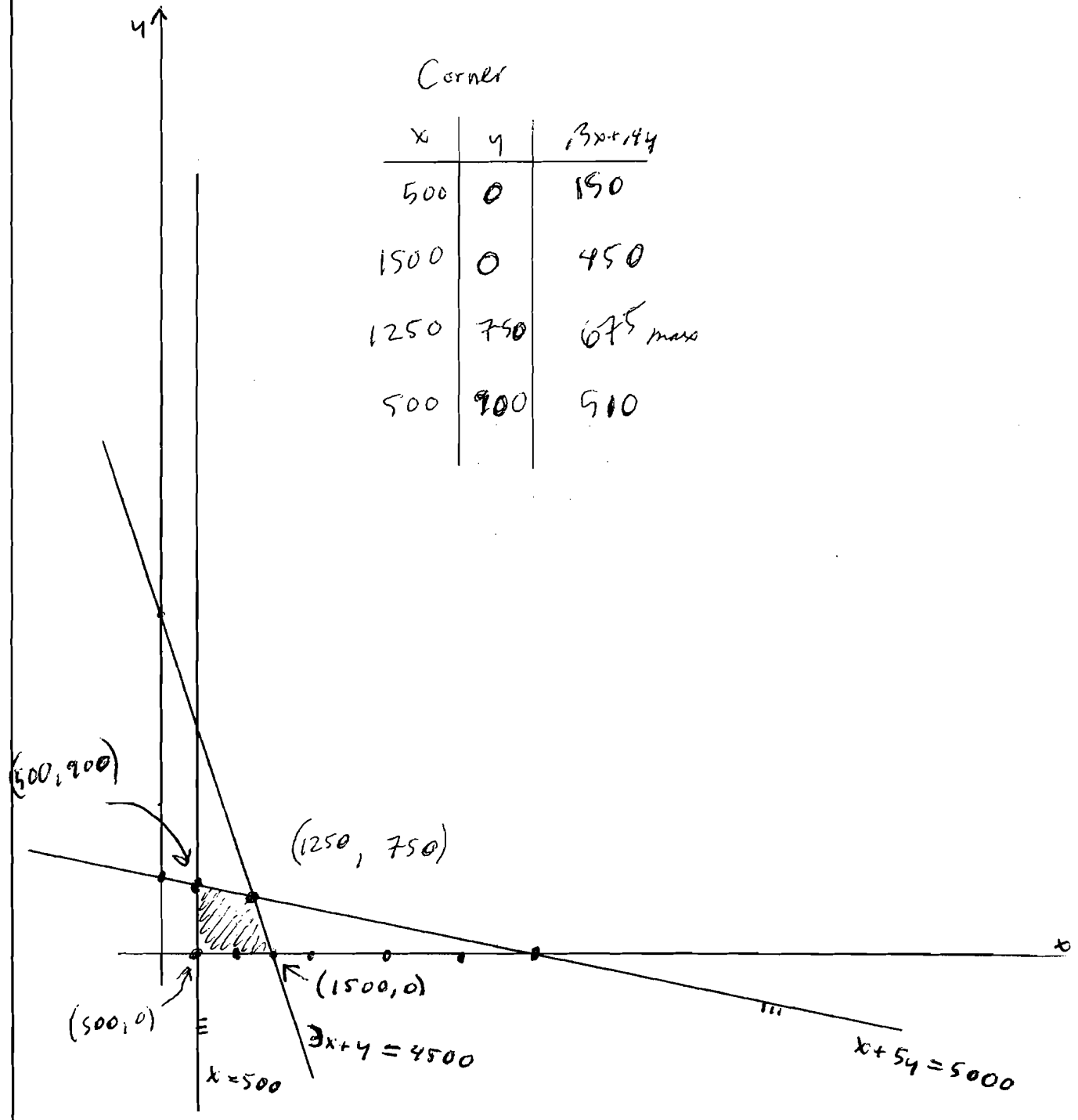
0 Starstreak bikes

250 superstreak bikes

27

Corner

x	y	$3x+4y$
500	0	150
1500	0	450
1250	750	675 max
500	900	510



Max profit $675 occurs for

1250 standard containers

750 heavy duty containers

28

Max profit of $675 occurs at

1250 standard containers

750 heavy duty containers.

(same ans as for #27)

Problem 29

	g flour	g butter	g poppy	g choc	dollar profit
Poppy Seed	400	200	100	0	2
German Choc	600	100	0	150	4
Supply	9600	2400	1500	2100	

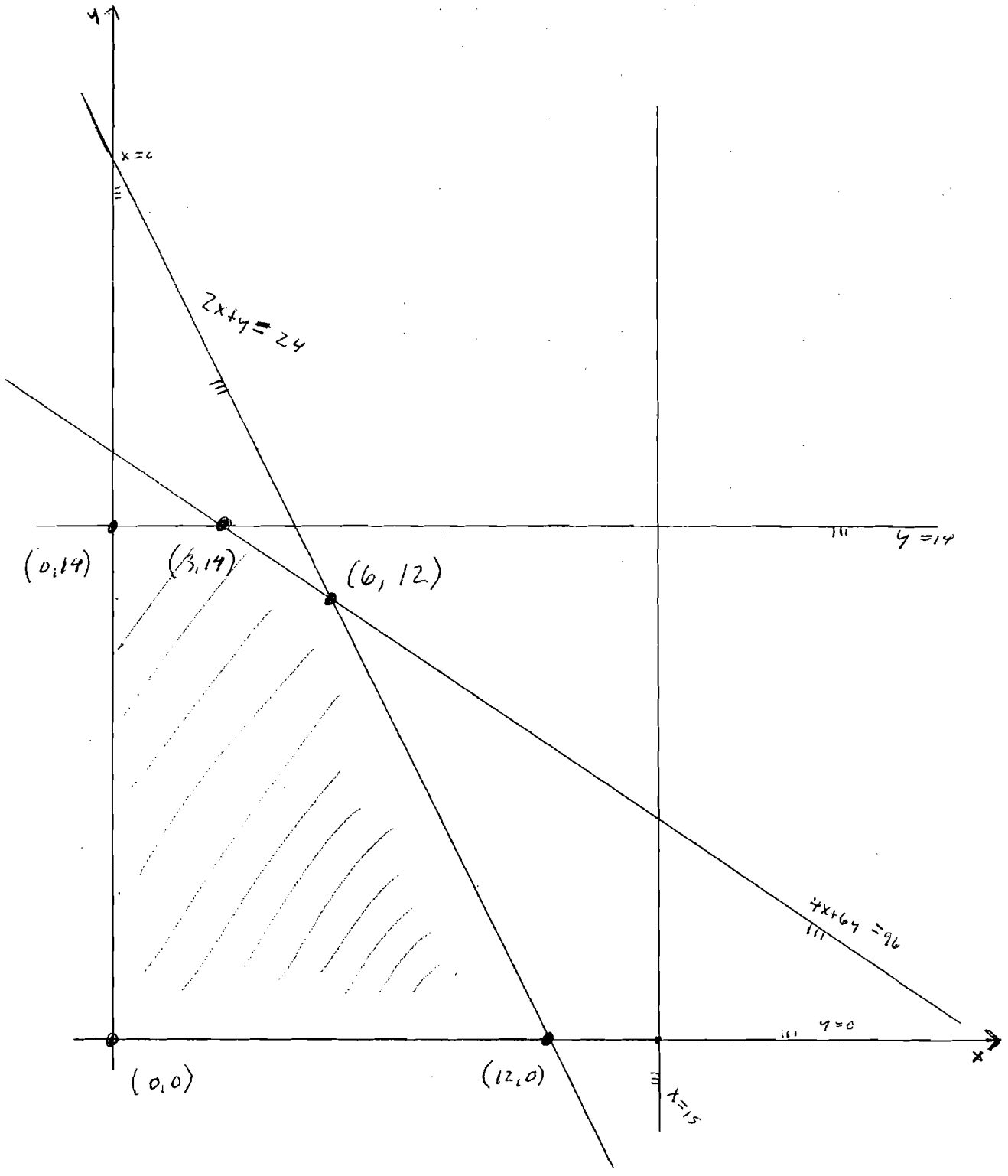
x = # of poppy seed cakes made each day
y = # of German chocolate cakes made each day

Maximize

$$2x + 4y$$

subject to

$$x \geq 0, \quad y \geq 0$$
$$400x + 600y \leq 9600$$
$$200x + 100y \leq 2400$$
$$100x \leq 1500$$
$$150y \leq 2100$$


y
x
x = 0
2x + y = 24
y = 14
(0, 14)
(3, 14)
(6, 12)
4x + 6y = 96
y = 0
(0, 0)
(12, 0)
x = 15

blem

29 cont

Corner pt

x	y	2x + 4y	
0	0	0	
12	0	24	
6	12	60	
3	14	62	← Max
0	14	56	

(a) Max profit of $62 comes from

3 Poppy Seed
14 German Chocolate

(b) No flour left

(c) 400g butter left $2400 - 200(3) - 100(14)$
$= 400$

Problem

30

Corner pt

x	y	$3x+4y$	
0	0	0	
12	0	36	
6	12	66	← Max
3	14	65	
0	14	56	

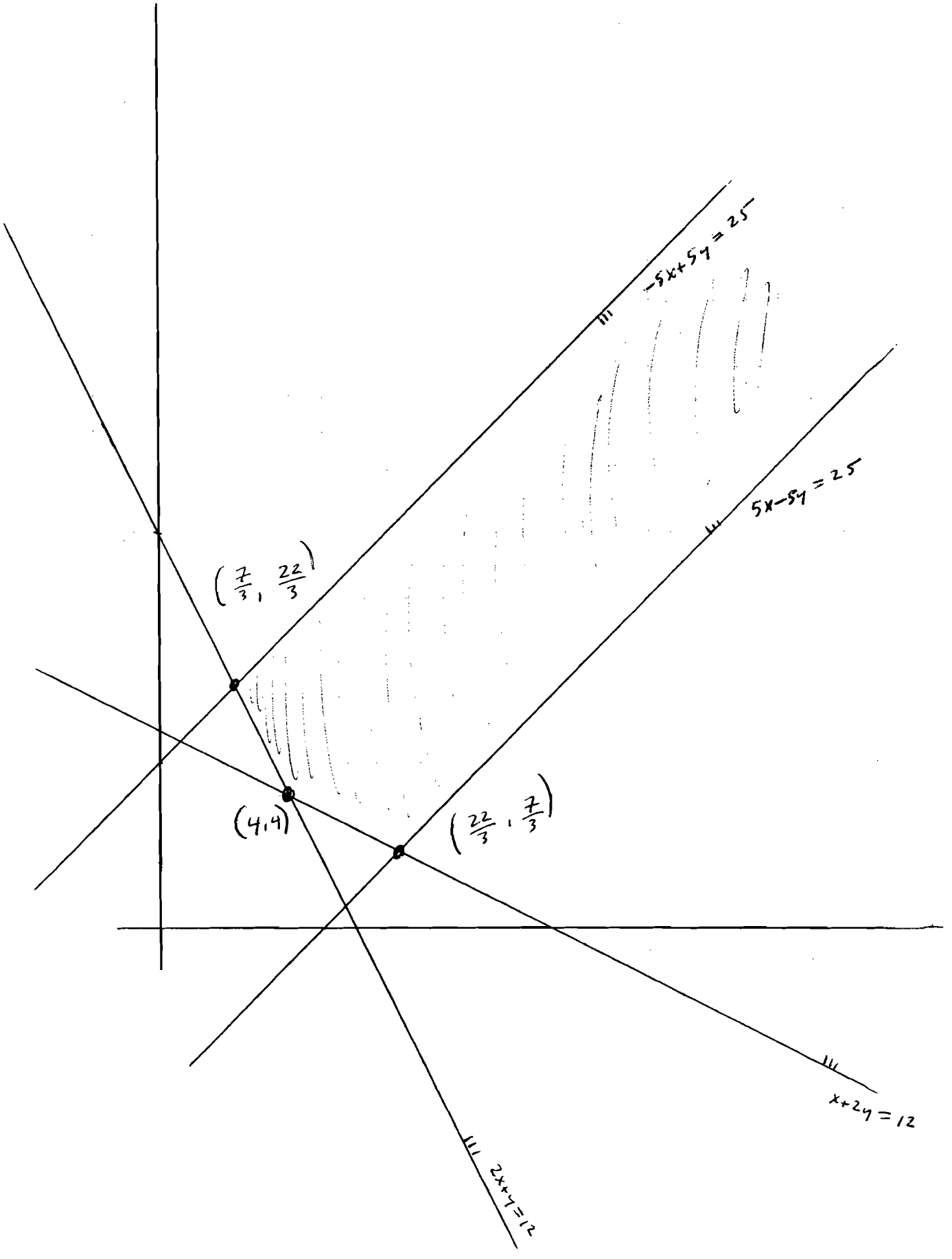
(a) Max profit of \$66 from 6 Poppy seed, 12 Germ Choc

(b) No flour left

(c) No butter left

Problem

31


$-5x+5y=25$
$5x-5y=25$
$\left(\frac{7}{3}, \frac{22}{3}\right)$
$(4,4)$
$\left(\frac{22}{3}, \frac{7}{3}\right)$
$x+2y=12$
$2x+y=12$

Problem 31 Cont

Corner pt

x	y	x−2y	x+2y	x+6y	−2x+y
4	4	−4	12 min	28	−4
$\frac{7}{3}$	$\frac{22}{3}$	$-\frac{37}{3}$	17	$\frac{139}{3}=46\frac{1}{3}$	$\frac{8}{3}$ max
$\frac{22}{3}$	$\frac{7}{3}$	$\frac{8}{3}$ max	12 min	$\frac{64}{3}=21\frac{1}{3}$ min	$\frac{-37}{3}$
extra pt					
8	3	2	14	26	−13 min
3	8	−13 min	19	51	2

(a) No min Max $\frac{8}{3}$ at $(\frac{22}{3}, \frac{7}{3})$

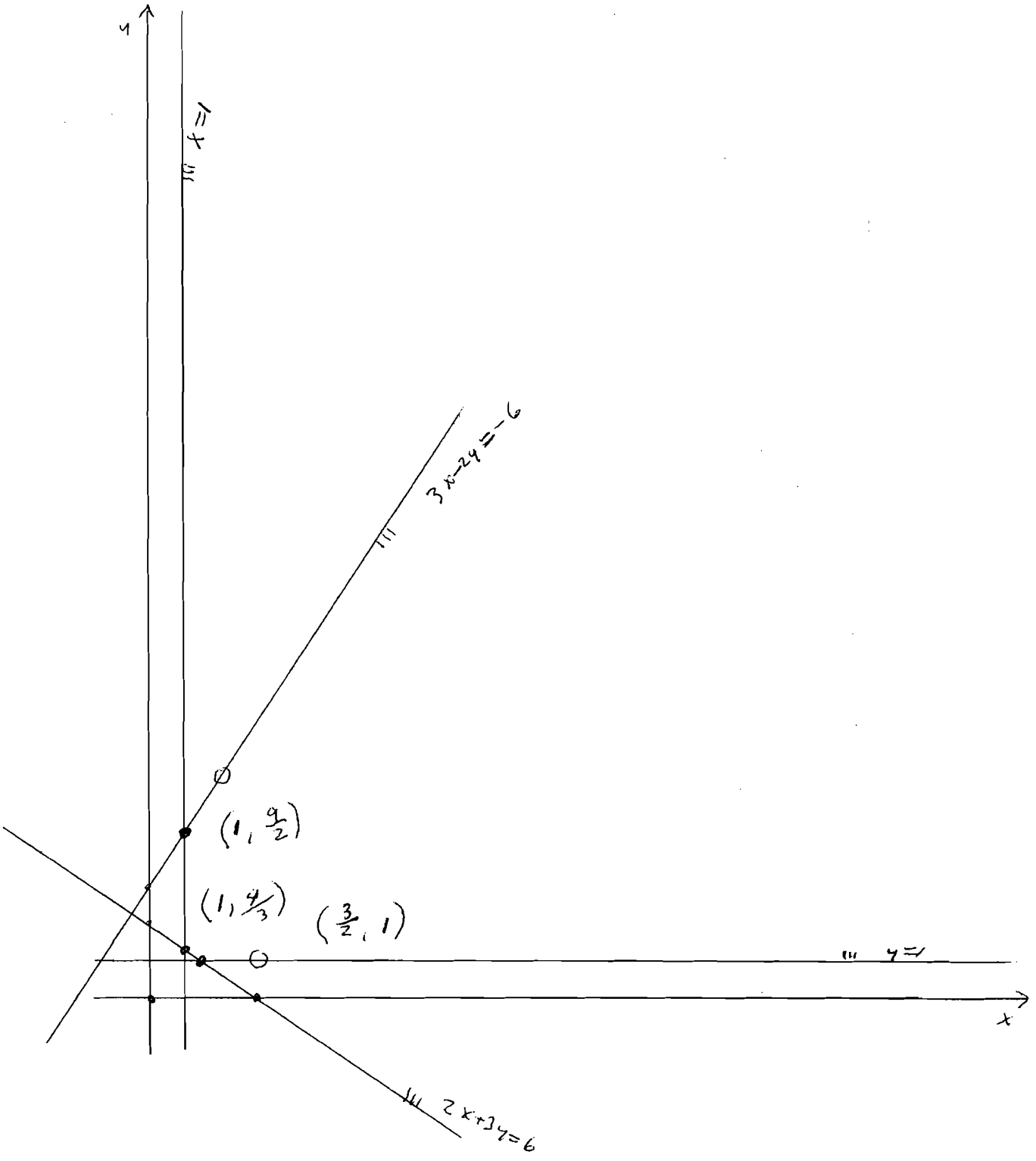
(b) Min 12 at $(4,4)$ or $(\frac{22}{3}, \frac{7}{3})$ No Max

(c) Min $\frac{64}{3}$ at $(\frac{22}{3}, \frac{7}{3})$ No max

(d) No min Max $\frac{8}{3}$ at $(\frac{7}{3}, \frac{22}{3})$

Problem

32



Problem

32, cont

test pts.

	x	y	$2x-y$	$-2x+3y$	$2y$	$-x$
Corner	1	$\frac{9}{2}$	$-\frac{5}{2}$ min	$\frac{23}{2}$	9	-1 max
	1	$\frac{8}{3}$	$\frac{2}{3}$	2	$\frac{8}{3}$	-1 max
	$\frac{3}{2}$	1	2	0	2 min	$-\frac{3}{2}$
Any	2	6	-2	14 max	12 max	-2
	3	1	5	-3 min	2	-3 min

	Min	Max
(a)	$-5/2$ at $(1, \frac{9}{2})$	None
(b)	None	None
(c)	2 at $(\frac{3}{2}, 1)$	None
(d)	None	-1 at $(1, \frac{9}{2})$ or $(1, \frac{8}{3})$

Problem

33

	Oz raisins	Oz peanuts	Oz apple	Profit
Regular	4	8	12	2
Deluxe	6	6	8	2.5
Supply	384	576	960	

1 Lb = 16 oz

$$\begin{array}{r} 2 \\ 24 \\ 16 \\ \hline 144 \\ 24 \\ \hline 384 \end{array} \qquad \begin{array}{r} 3 \\ 36 \\ 16 \\ \hline 216 \\ 36 \\ \hline 576 \end{array} \qquad \begin{array}{r} 60 \\ 16 \\ \hline 360 \\ 60 \\ \hline 960 \end{array}$$

x = # boxes of Regular mix

y = # boxes of Deluxe mix.

Maximize $2x + 2.5y$

subject to

$x \geq 0 \quad y \geq 0$

$4x + 6y \leq 384$

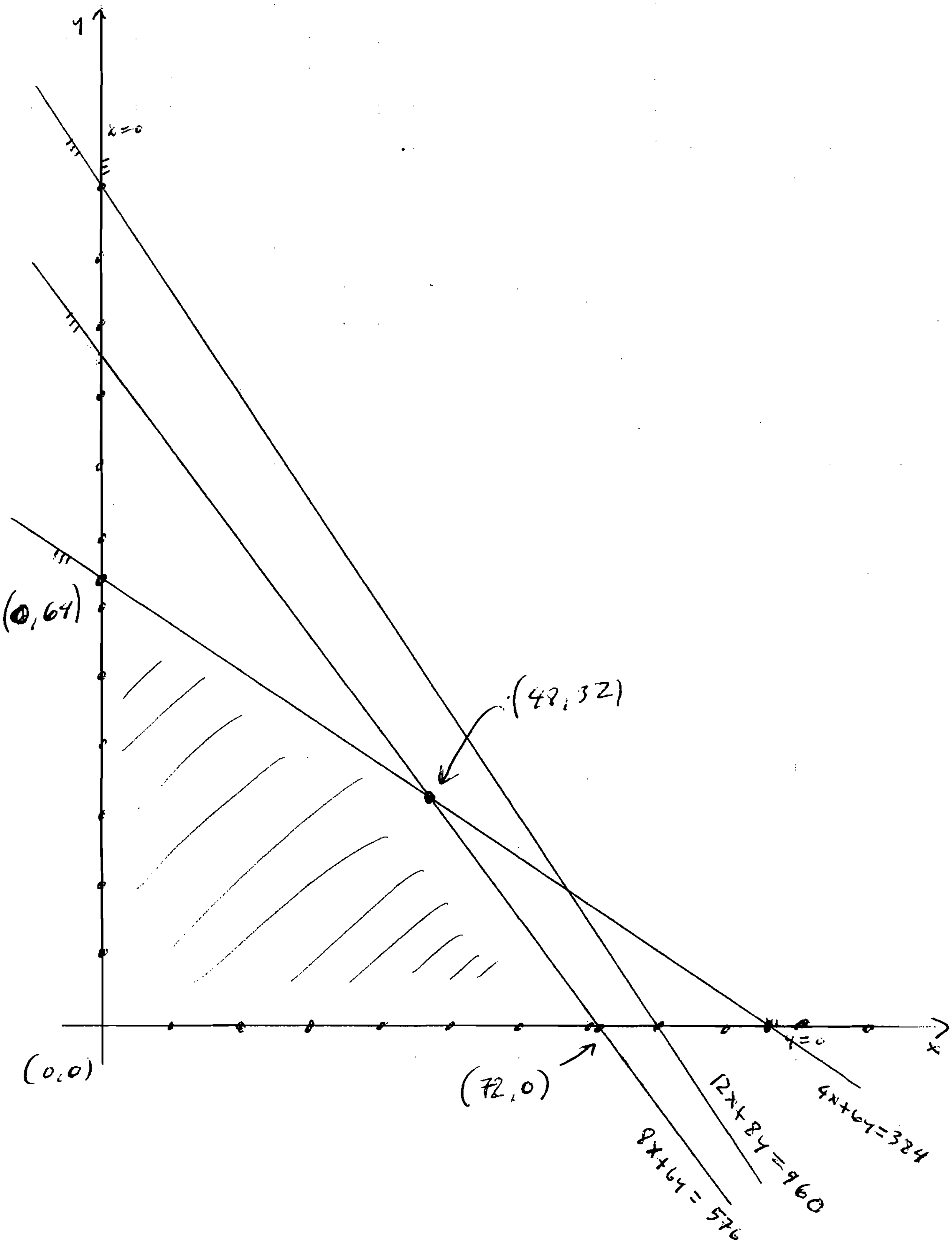
$8x + 6y \leq 576$

$12x + 8y \leq 960$

Problem

33

Cont



Problem

33 cont

Corner pt

x	y	$2x + \frac{5}{2}y$
0	0	0
72	0	144
48	32	176 max
0	64	160

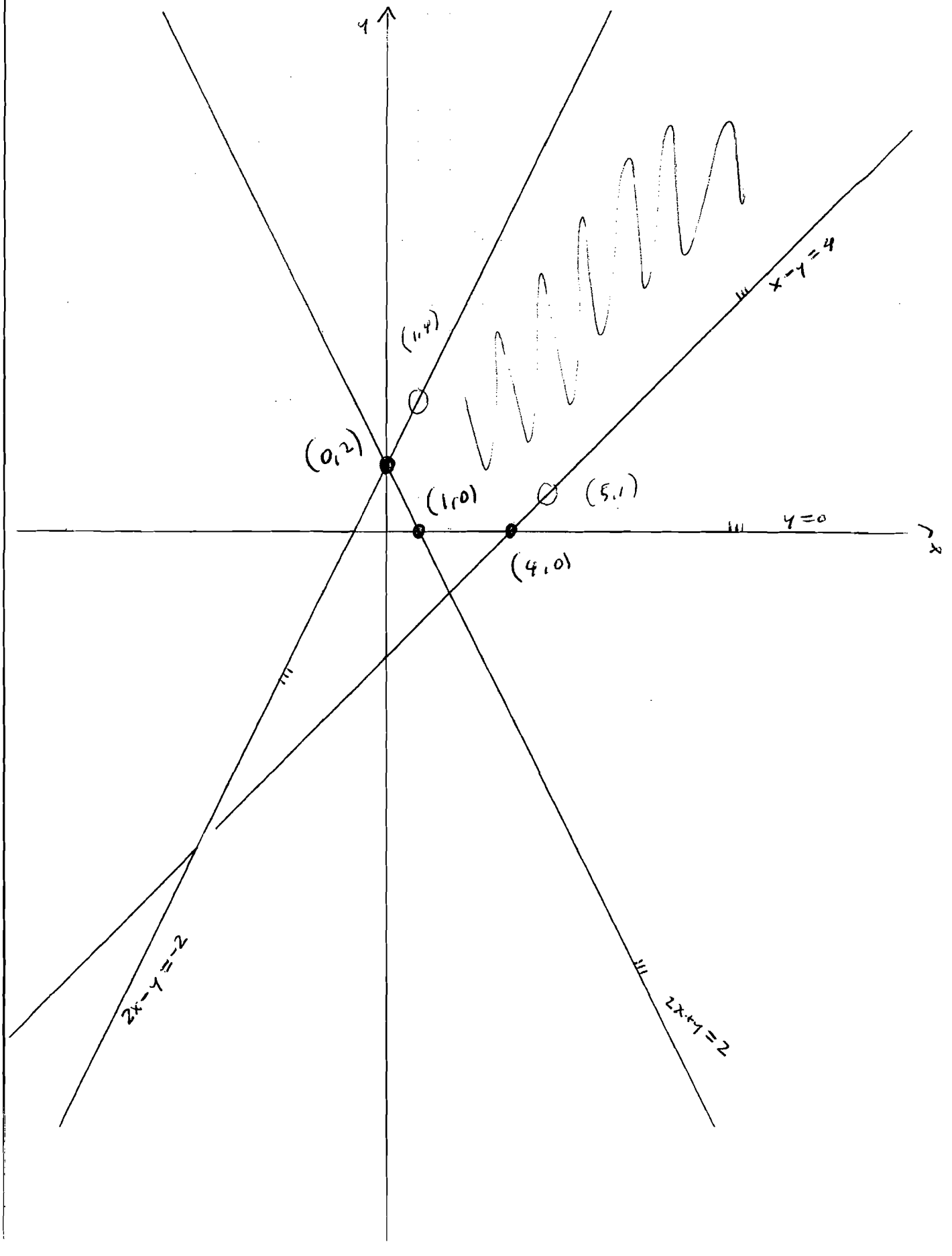
Max Profit $176 from

48 regular

32 deluxe

□

Problem 39



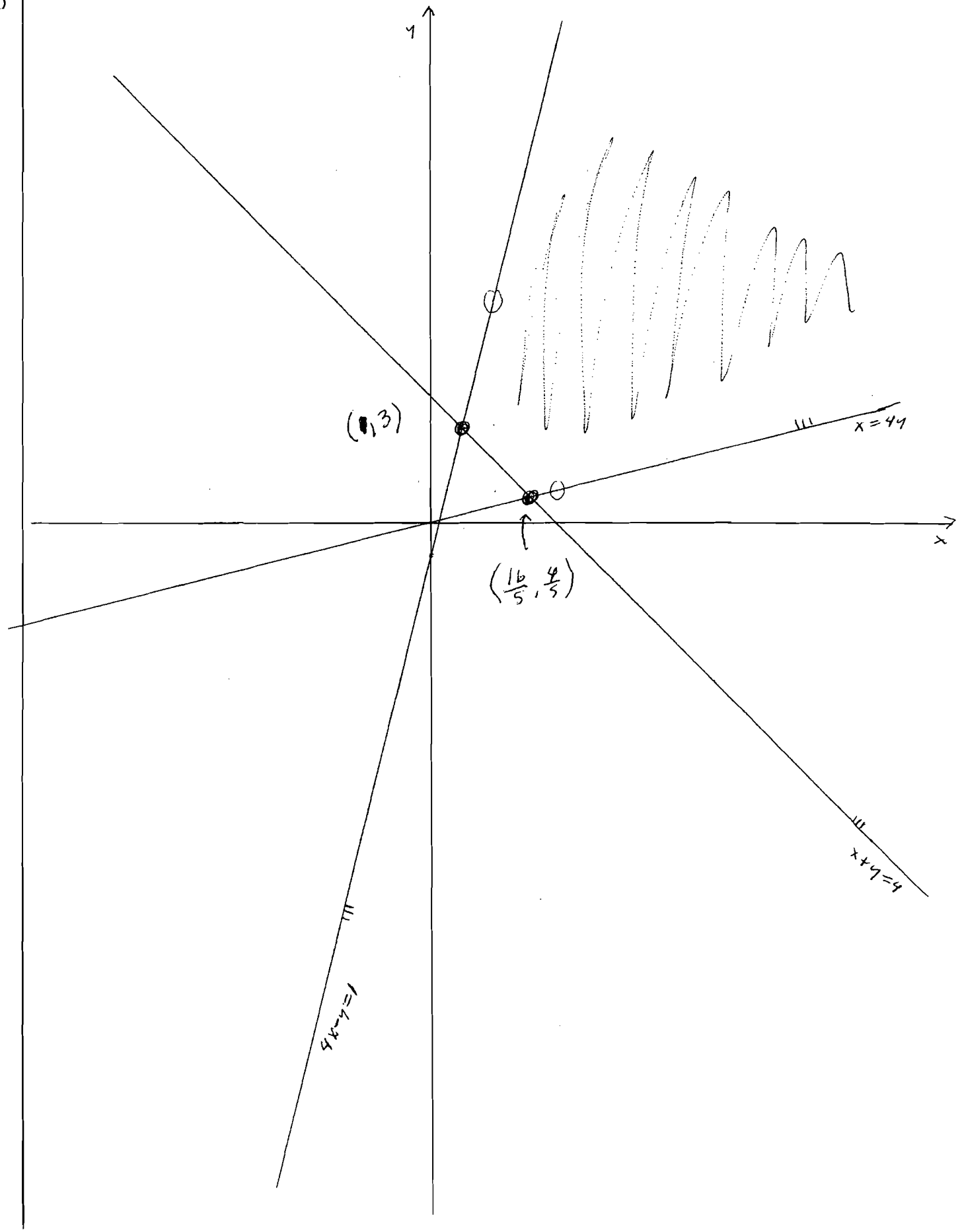
Problem

34
Cnt

	x	y	3x − 2y
Corner pt	4	0	12
	1	0	3
	0	2	−4
Answer	5	1	13
	1	4	−5 min.

No max

Problem 35



Problem

35, cont

	x	y	$2x-10y$	$2x-6y$	$2x-8y$
Corner	1	3	-28	-16	-22
Corner	$\frac{16}{5}$	$\frac{4}{5}$	$-\frac{8}{5}$ max	$\frac{8}{5}$	0 max
Aux	4	1	-2	2 max	0 max
Aux	2	7	-66	-38	-52

(a) Max $-8/5$ at $\left(\frac{16}{5}, \frac{4}{5}\right)$

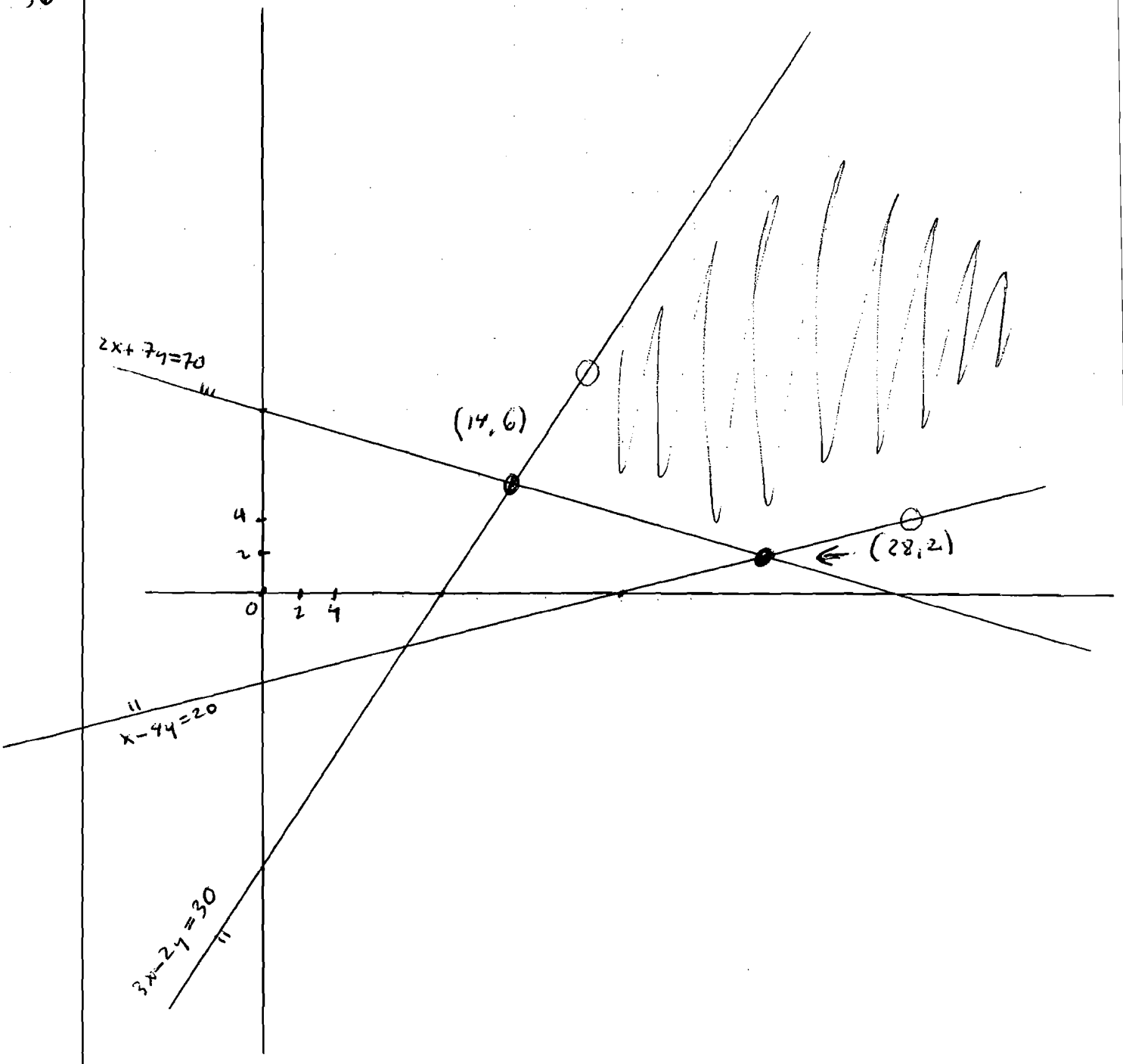
(b) No max

(c) Max 0 at $\left(\frac{16}{5}, \frac{4}{5}\right)$

Problem

38.5

36



Problem

36, cont

	x	y	x − 5y	x − 3y	x − y
Corner	14	6	−16	−4	8
Corner	28	2	18 max	22	26
aux	18	12	−42	−18	6
aux	36	4	16	24 max	32 max

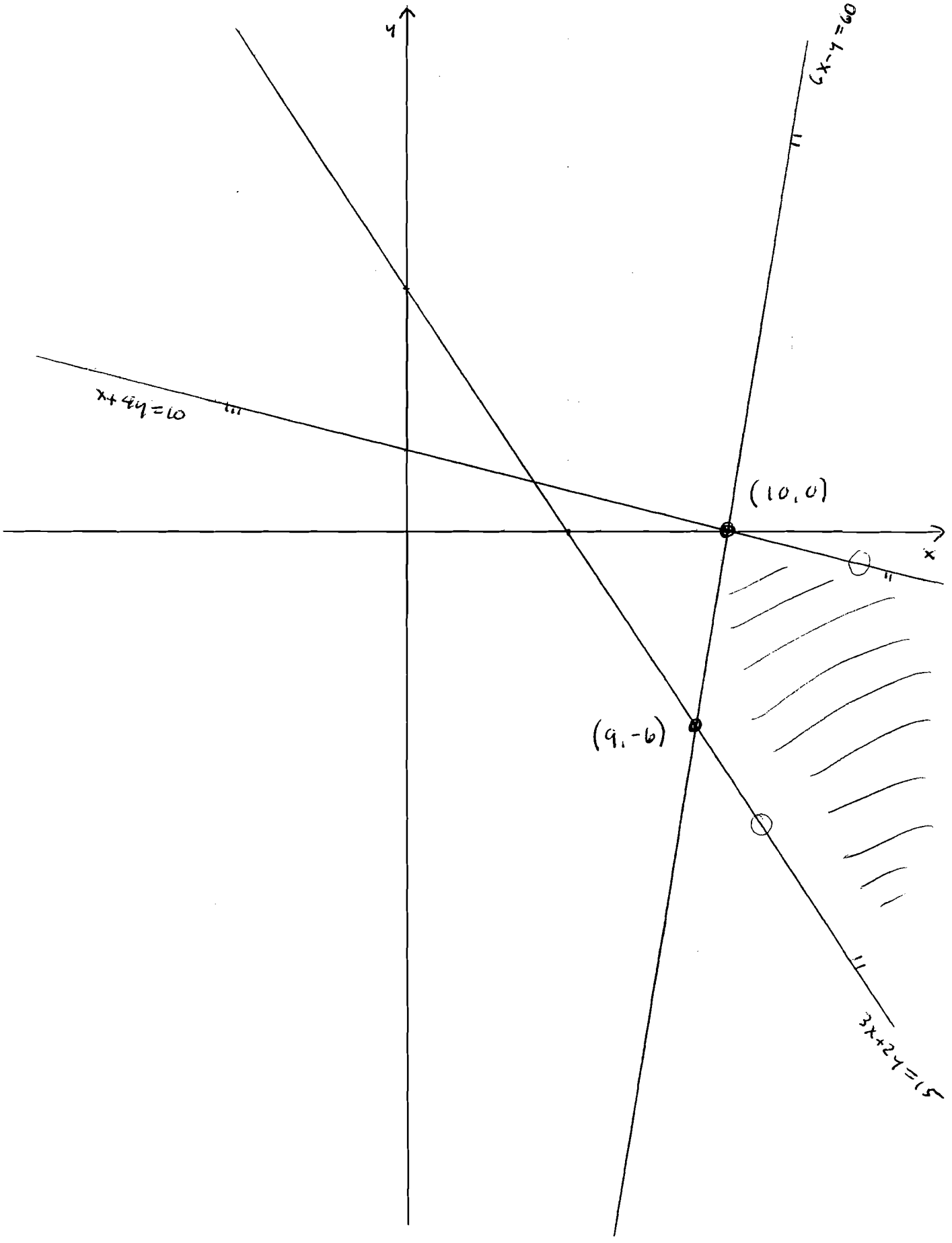
(a) Max 18 at $x = 28$, $y = 2$

(b) No max

(c) No max.

Problem

3.7



Problem

37
Cut

typed in BK

	x	y	2x+y	x+y	x−y
corner	10	0	20	10	10 min
corner	9	−6	12 min	3	15
edge	11	−9	13	2 min	20
edge	14	−1	27	13	15

(a) Min 12 occurs at $x = 9, y = -6$

(b) No min

(c) Min 10 occurs at $x = 10, y = 0$

Problem

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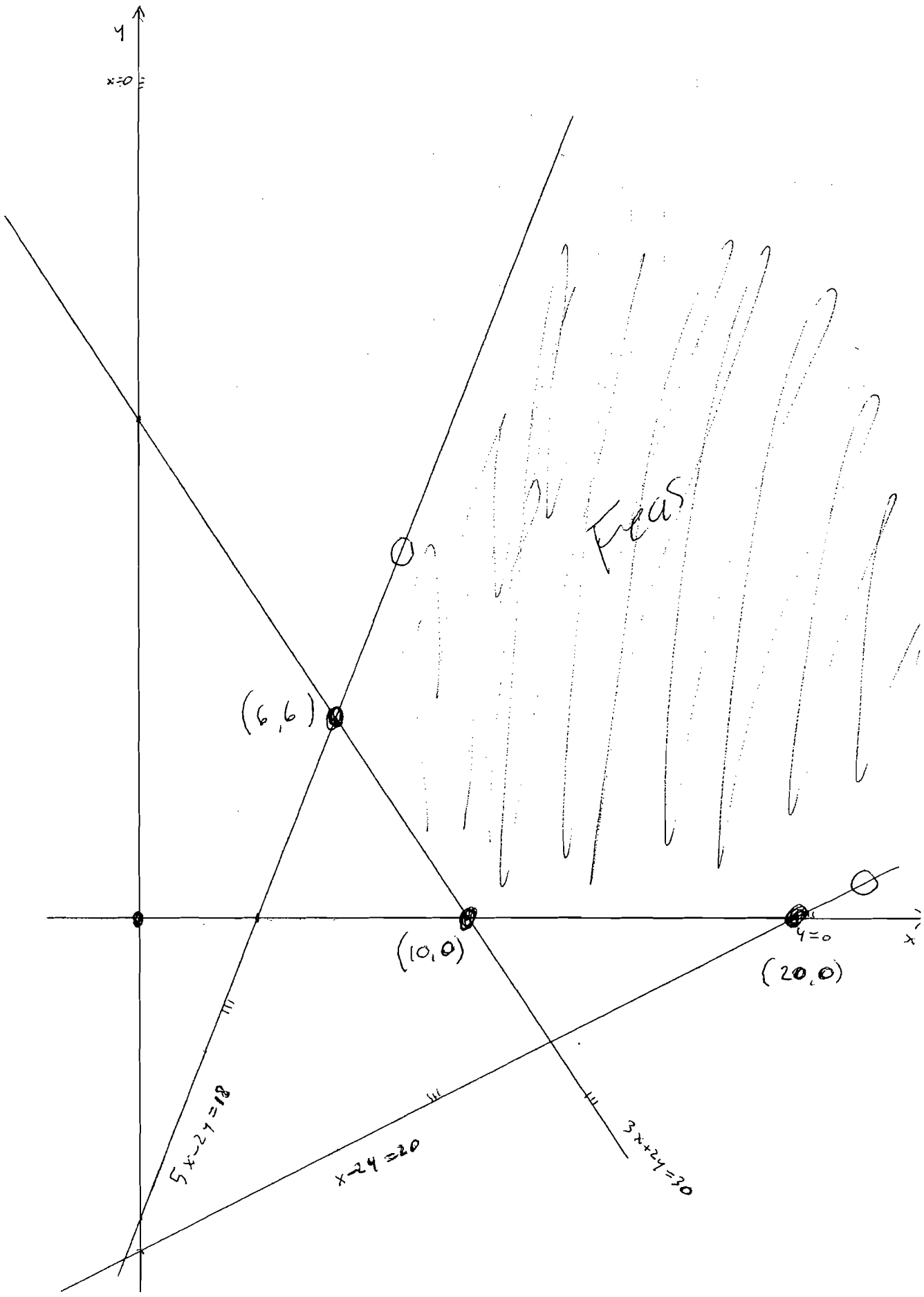

Problem

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	pts x	y	x−y	x−3y
Corner	6	6	0	−12
	10	0	10	10
	20	0	20	20 max
aux	8	11	−3 min	−25 min
	22	1	21 max	19

(a) No Max No Min

(b) Max 20 at $x=20; y=0$

No Min