

LINEAR PROBLEMS Solve through following inequalities;

$$1.3x - 5 > -2$$

$$Q \quad \frac{2(1-2x)}{3}$$

NB : In solving linear inequalities to take the LHS as positive

(1) BON T ftpt-ccu

inequalities
following
inequality

Sign an equal sign

(2) When divided by a negative number, the inequality sign must change.

Therefore, the inequality

MUST change „

Following the ILCE and

the sign of the inequality

is given below.

An unbalanced equation

(1) LHS = RHS

the balanced equation

Dun

on CL

,

Eg: $2x - 7 = 3x - 2$

Value

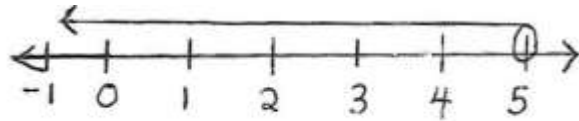
is

$$2x - 7 = 3x - 2$$

Solution:

First we take the variable terms on one side and the constant terms on the other side.

$2x - 3x = -2 + 7$ or $-x = 5$ therefore $x = -5$ Show our solution



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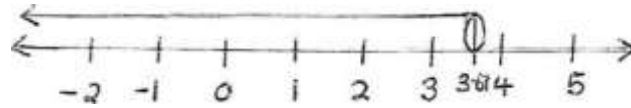
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$$-2x - x \quad -2-5$$

$$-3 \text{ (I) } -11$$

$$3 \cdot e^7$$



$$= 34 .$$

目 9 3 , F の も u ル 39r の し v の し バ bhü-z ら し つ ワ 十 一 32 ゃ 一 3

inequalities
and

shown below

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$$\text{午 } 3 \text{ (エ) } -3$$

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$$7-3 \text{ エ}$$

$$4 - 3x \quad -3$$

3 プ . -

$$\text{エ} \cdot \text{フ} / \text{ - } 1$$

$$\text{or } : \text{元乙} : 2 \cdot 3 \cdot 3$$

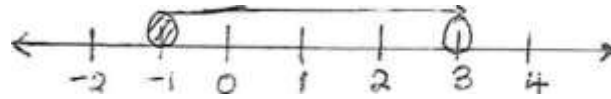
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ttun oe Q010001000

b) Tnz Ota-I US t L bccKS ax Chg ' 500 each and
Y Lt Shs, 300 each not rn-ore thæn
Shg, Q OOCC .

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X book g *cost* h' 500 x

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Y Pencil r-cs+> chg - accs

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•500 % + 300 g 4 aoooo lh.uo

ßducc *the* L necwa-LLy

100

too

IOC

$$= 5J + 3B \text{ e200}$$

C) A student bought pencils at 750 each and pens at 600 each. She spent then

Shs, 9000

$$\begin{aligned} 1150p + 500t &= 9000 \\ 230p + 100t &= 1800 \end{aligned}$$

Example 1

Mrs. Ma-Kaga is going to bake cakes for her business. She wants to produce 200 cakes; she wants to bake round cakes and chocolate cakes. Due to time and facilities she can not bake more than

100 round cakes and 160 chocolate cakes. Each round cake costs 1000 Shs and each chocolate cake costs 1200 Shs. How many of each type should she produce to make maximum profit?

d) How many cakes of each type should she produce to make maximum profit?

(P) $1000x + 1200y = 180000$ Bf CaJ(es Cfu can barw
 cuncl gtLLC ma-ge cc $x = \text{number of round cakes}$
 $y = \text{number of chocolate cakes}$

WTO o

Lit uu nunn-ber
number of

Cakes be x and the

Identify $x > 2$

then $y > 16$ above.

d) -tt1L number CheocccaL eaJcen

More ~~chocolate~~ ^{yellow} cakes

t ha-n ChDtDL&tL cameo

Th.L Eocca n,,urnbes of cakes CtlL Can bake

CIO To make profit

$$600x + 1000y > 9000$$

$$3x + 2y > 16$$

ITu inequalities from the quest ON

db Y 7 z

Next represent your inequalities on a graph then shade the unwanted regions to show feasible regions.

The lines to be plotted are

Ecole

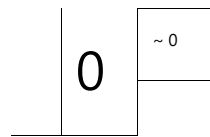
$$y = x$$

$$x + y = 10$$

$$3x + 2y = 16$$

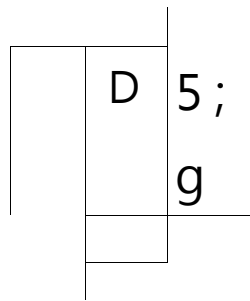
But $x = 0$ and $3x + 2y = 16$ are dotted lines because the inequality sign.

$$\text{for } x + y = 10$$



(0, 10)

$$\text{for } 3x + 2y = 16$$



(5, 3)

i) To find out the maximum profit she will get we identify the integral values in the feasible region which are any values near the top or at the border of

at (3, 7)

(3, 7) @ / \ dfOd eat

be got

$$8) = a K | 500 + g X 000 = 11$$

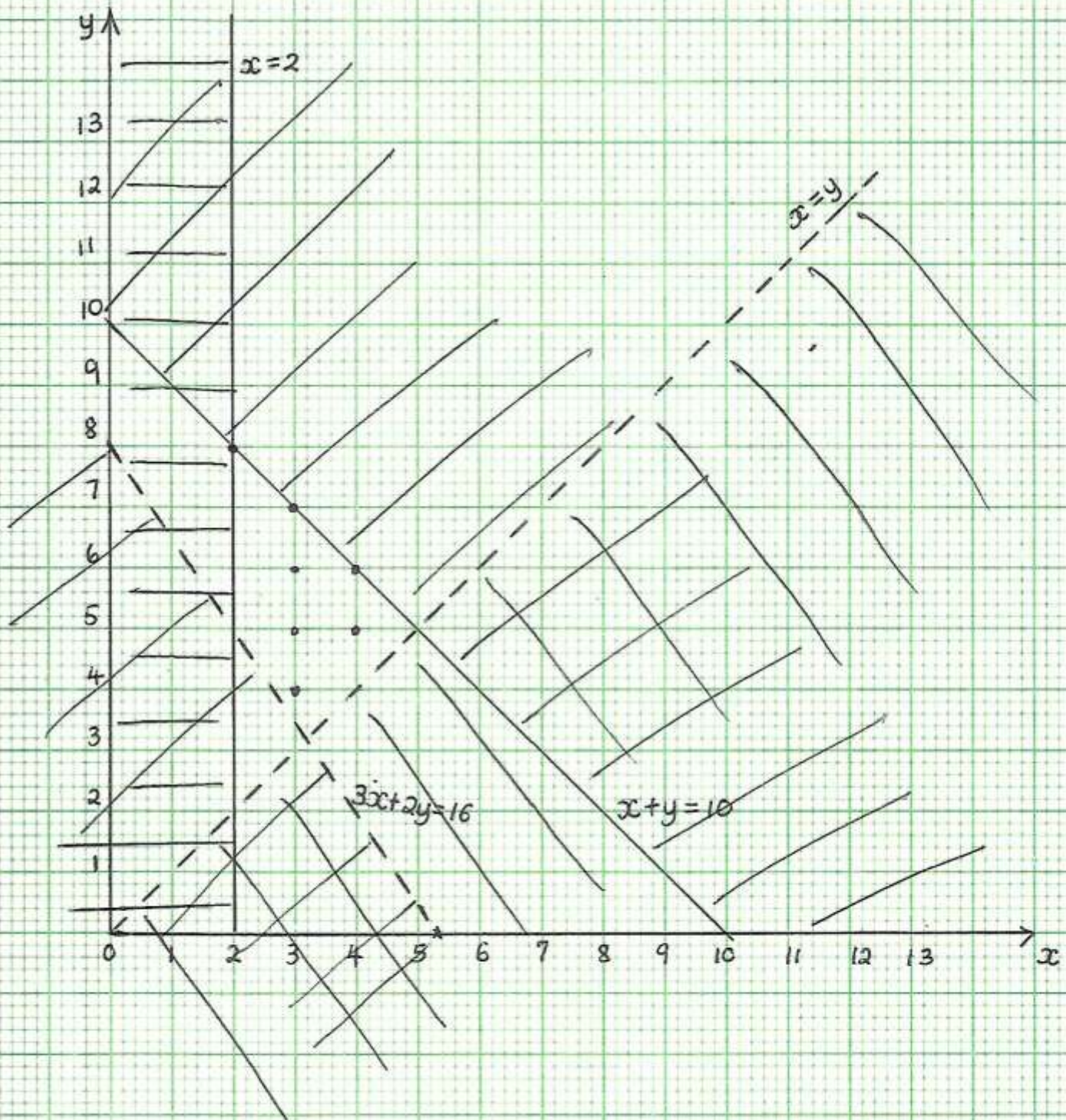
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$$= 4 \times t500 f Gx1C0\ddot{=} 1$$

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Example 1



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(31 s) 3 X 1500 + 5KiOC0=qgoo

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7 and 5 *tonnes*

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eLthLR by LDcn-J or bucl< *wasshsq* gopoo .

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) go,000 tr'qos macL by th-L Lorry ace-l *notexud* th-
 cge mæcL by e tw tipper trucu .

a) If and % pc present tt-u number Lrcps mad-L by thL lorry and thL tipper
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d) dDIDjn fivi UU+LCU-Lüio yepr-e,,oenub du *given* thformaLco o ,

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Joc t 5 g 7/ 34

tonnes% sand needed be IDSS

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In equaLCCgr n

The D *ther two inequalities*

ShDœuS9 tlu poscLbLLLty that thL Lorry truck were hired to transport the goods.

ttu Ecppen

a. The inequalities are

$$5x + 3y \geq 34$$

$$x + y \leq 6$$

$$x \leq y$$

$$x \geq 0$$

$$y \geq 0$$

cii) Plot the feasible region on a graph representing the constraints.
(format)

o PIA use

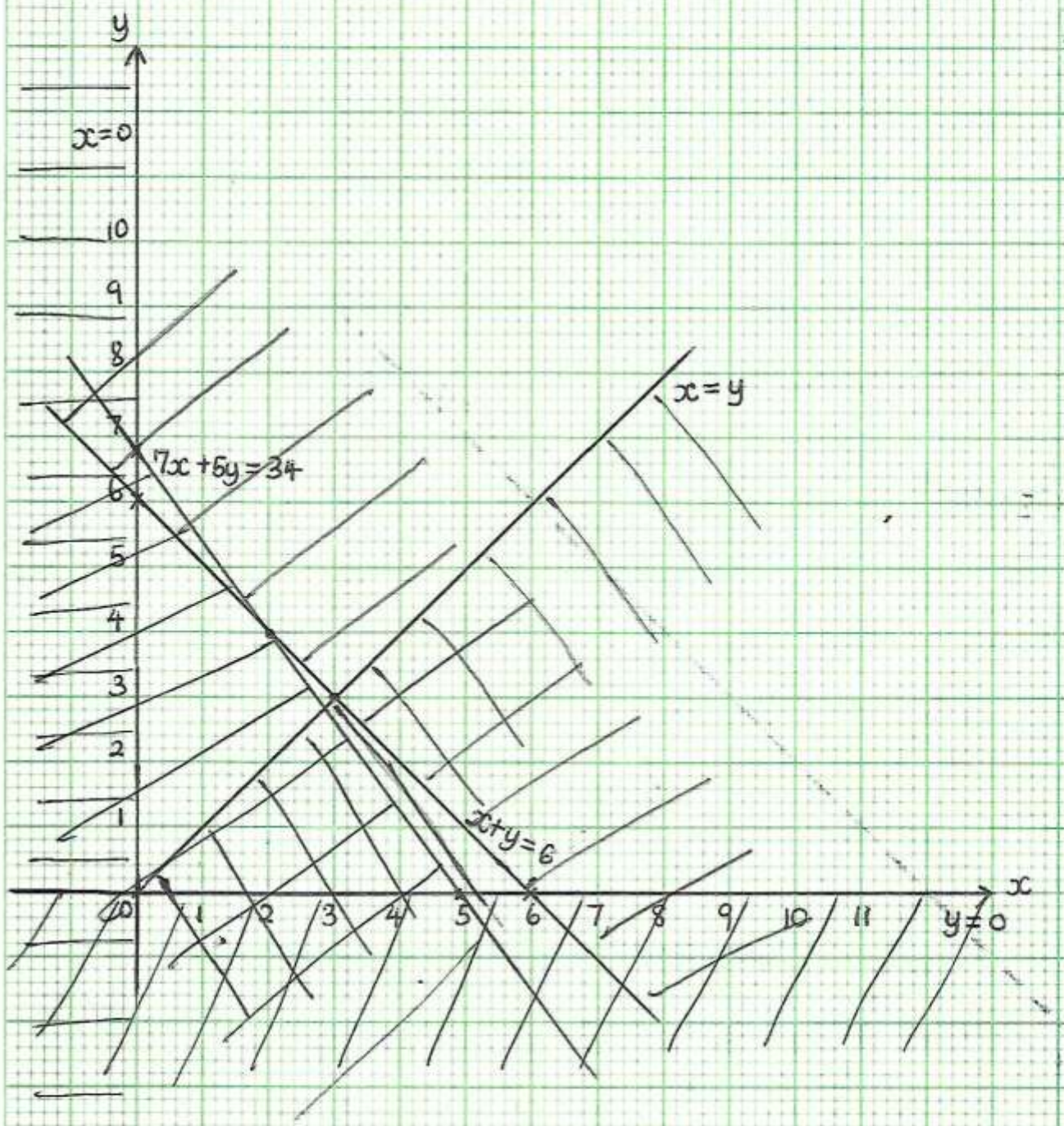
x	0	4.9
y	6.8	0

$$x + 5.8y \geq 34$$

x	0	6
y	6	0

=C)

Example 2.



bå) Fom goph a(ii) above r-u_JTLben 0b trips that each ve_hJd-L can ma-IQ go CIP to mud a-Doe tonnage % sand transportzå.

(313) rne Lorry mcke a traps and btu tLf5per truck 4 trips or btu CD-n 8 treps thL •tipper ercccK
 3 trcös *Frid*tu number eb trqös by ecch thazmczd-L •Clu geo-Lot tetæC tonnaege ,

$$=QI + 15$$

ThL greaDot total Econage wan mæd.c 3 treps % thL
 Lorry D d 3 tr-tp's 0b thu tLppertruck.

Example 3

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14 *students* , All thL 126 *students* contrüb wteåa total

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or y DC

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ShDLDi-ng that tfuc bug cod punibwo were h] "LL to trans

inequalities

port iie $5x + 5y \leq 40$ ape

31 2/ q

DC Ly

DC 70

Plot the two lines on the same graph.

These lines are

$$3x + 5y = 40$$

$$4x - 5y = 40$$

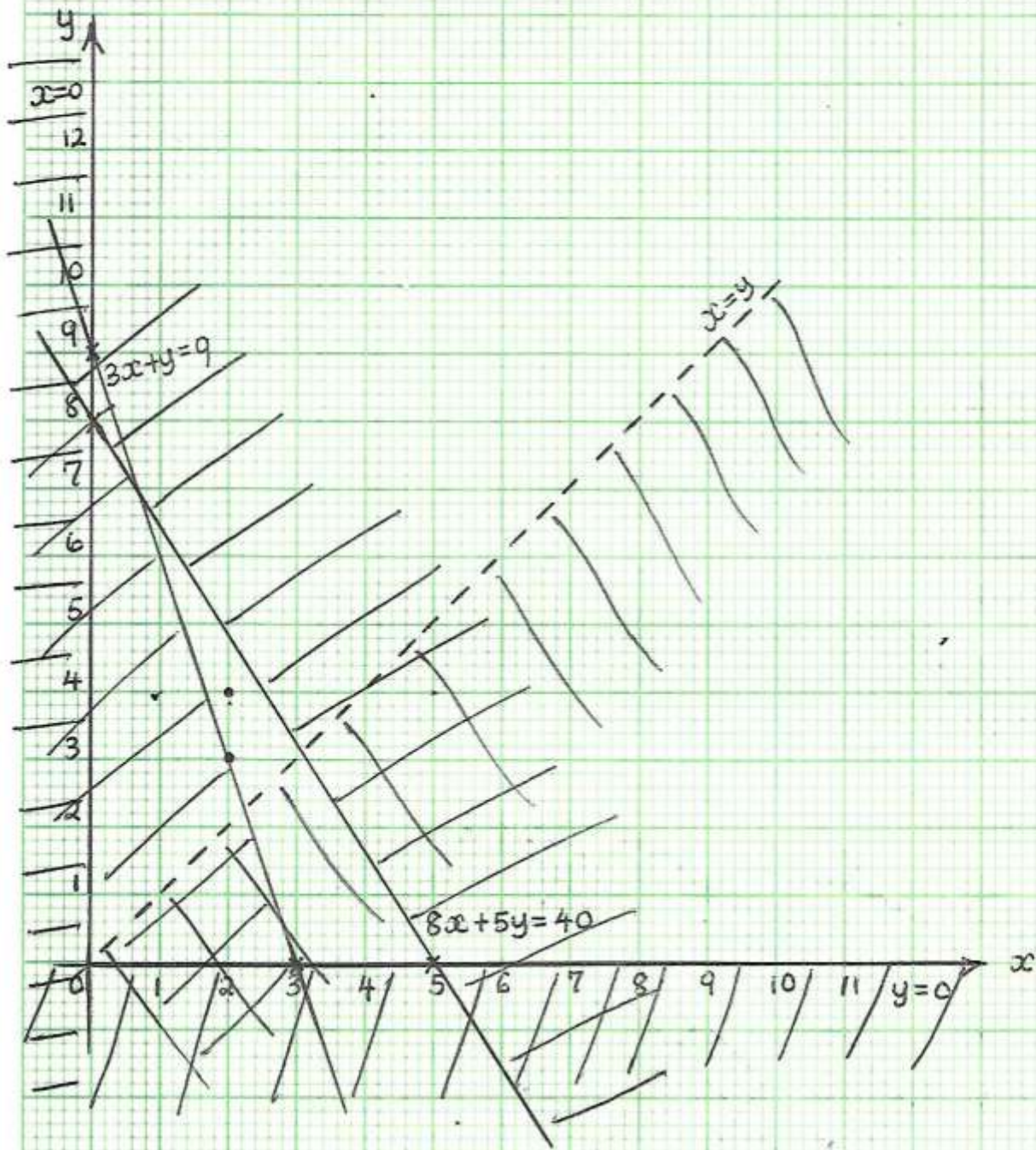
x	0	5
y	8	0

$$3x + y = 31$$

for 3D-FYS q

x	0	3
y	9	0

Example 3



(u) g y ChcucluS9 tu cn wcuuact ægccio S{ucu) btuwîn
 SCLüJOfyupg co-L tlu *inequalities*

C) eh-L graph to Dumvber % tm-ps each vehccl= ghoul-LU ma-
 Vc sc Lo to Spend btu muc tm-ones •

F,-cm •thw *feasible* rtgcc7J oca-r (_nLr,tj/o.Z values are

21 3) cncL (a) 4)

$$2 \times 40,000 + 3 \times 25,000$$

$$= 80,000 + 75,000$$

$$= \text{Shs } 155,000$$

$$= Q \times 40,000 + 4 \times 25,000 = 80,000 + 100,000 = \text{sho } 180,000$$

$$= 180,000$$

busghDu-Ld ma-JRC Q tili»s and thxmini b

3 bn-i3s So co *to* tlu Lant 0-mou-n.c % *money*

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% *per day and that*
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total number of bicycles that can be produced bccycLo pen d.g (1) hL9hL%Jt ruunbex
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Number of <i>working</i> hours hect	1200	4 days
Expected profit per hectare	9000	15700

sketch the inequalities on a graph

on your graph, find the number of seeds of each which must be sold to give the maximum profit

to give

Profit: 9000 (Type revenue - cost) = 15700

Subject to $1200x + 1500y \leq 12000$ and $4x + 3y \leq 4$

a) and $4x + 3y \leq 4$ (3 *respect* $x \geq 0, y \geq 0$)

ii) On *both* axes, draw the graphs and label the unwanted

iii) Find all the possible number of truck so that the transport cost

is minimized

A to plot on a graph axes and label the axes

the feasible region with estimates for

Total cost = 1200x + 1500y (lags 1200)

By *representing* the number of seeds to be planted with x and y number of hectares to be planted

L.D11h petatceh) conLc down Eh-c l_-n.fccwcdLtöd for

d) Cost pjDJeet V) (icy S eg *hectares* used uh thL pjqee&
pcsstbLty Cha-c *teicL (JILL cd loot be

(iii) *New wheat* [LDecJ cn %tt-uun cr petc-Lt06D .b) hJritc down

(iv) The poss *expression* blu profl,,t P , in *terms*
planting DC and g .

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unocn%-d *regions.*

(u) use g *graphs* to dcte-rm-uu how the ghsu-Lcl wge bo maKüm-Be
Hence *bound the*
regions m QkUf% UUn TD

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wise

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as crates of soda are needed A CJUtl %beer

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beULO bar and Soda ax nucLcd .

A *maximum* eb gh9• maud be spent en bun anc16cr-t
une aCoo-L Costs Shs, 401 ODO cncL 9b.

Soda costs gbs. 16000 ad) *inequalities* repueruL •blu above
statili) Ref)R-ment thL above LheowaLåßD ganu axeoc

By shading *guchfguy*
unwanted region, represent the region
inequalities above.

b) From graph, and Soc1L
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o.

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6.A

ha S Shs *250,000*

He buys *SDXŁo 600*

Shs, 25000 Cach und boxeo efr candŁo oz śhś f o ooo

the money

Spent en bccvės ó

at least shs. 500

50000 than *that*

he buys at least

on CLncLLg, He

5 boxe;o

book ś ond OL LLOut boxŁo

CJIncULo,

C) *bring* down four inequalities
information.

to represent CtU0

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(4) Lđst OL łhL pcsścblc rułsnZers c-C boxeo C^LV *book sd*

Caod8łL> hL *can t*

C)

trader, śjQDaLd

au-m-b?J % Łoxeo % *book* SDncl tanCLILD *that*
So QS *to* gpend cuLms