

536 - (0580-S 2012-Paper 4 (Extended)/2-Q3) - LINEAR PROGRAMMING

Pablo plants x lemon trees and y orange trees.

- (a) (i) He plants at least 4 lemon trees.

Write down an inequality in x to show this information.

Answer(a)(i) [1]

- (ii) Pablo plants at least 9 orange trees.

Write down an inequality in y to show this information.

Answer(a)(ii) [1]

- (iii) The greatest possible number of trees he can plant is 20.

Write down an inequality in x and y to show this information.

Answer(a)(iii) [1]

- (b) Lemon trees cost \$5 each and orange trees cost \$10 each.

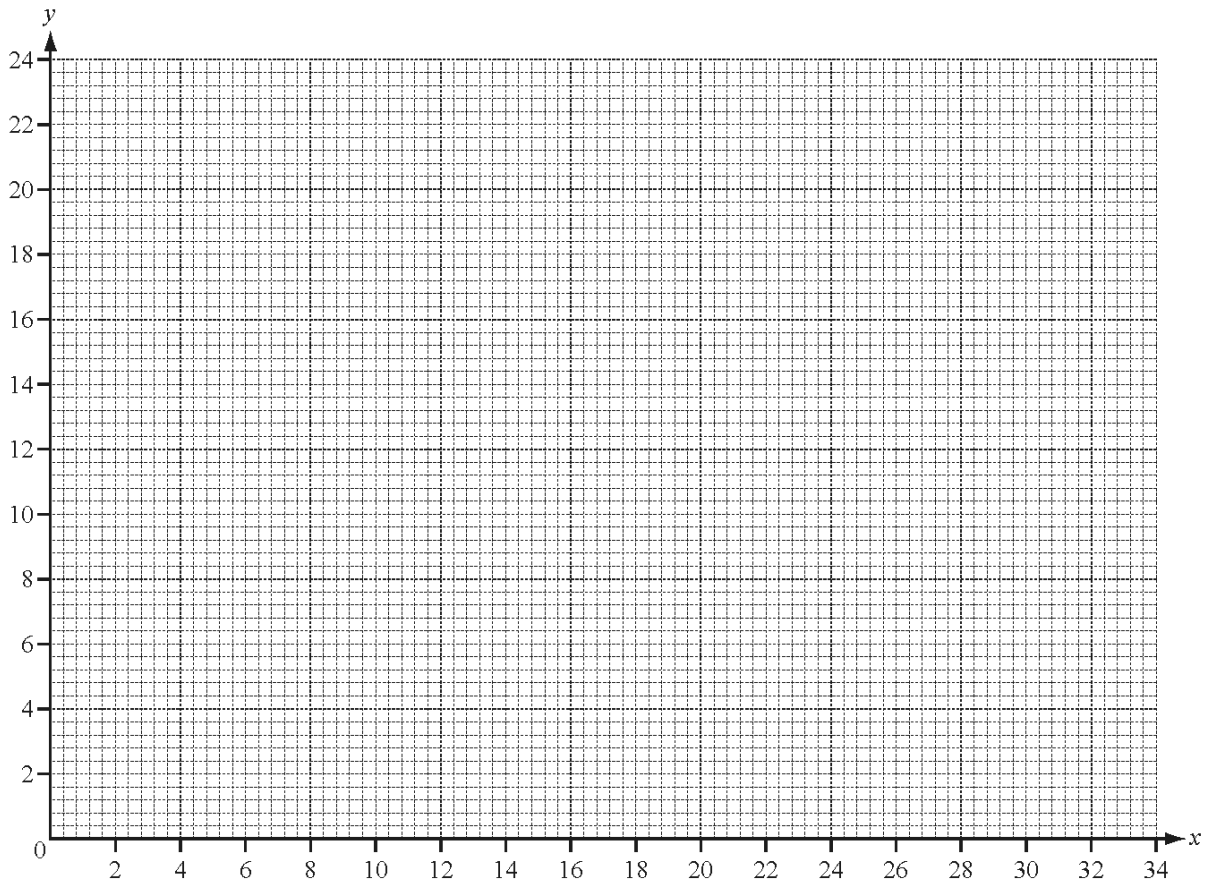
The maximum Pablo can spend is \$170.

Write down an inequality in x and y and show that it simplifies to $x + 2y \leq 34$.

Answer (b)

[1]

- (c) (i) On the grid opposite, draw four lines to show the four inequalities and shade the **unwanted** region.



[7]

(ii) Calculate the smallest cost when Pablo buys a total of 20 trees.

Answer(c)(ii) \$ [2]

537 - (0580-W 2012-Paper 4 (Extended)/2-Q7) - LINEAR PROGRAMMING

Jay makes wooden boxes in two sizes. He makes x small boxes and y large boxes.

He makes at least 5 **small** boxes.

The greatest number of **large** boxes he can make is 8.

The greatest total number of boxes is 14.

The number of **large** boxes is at least half the number of **small** boxes.

(a) (i) Write down four inequalities in x and y to show this information.

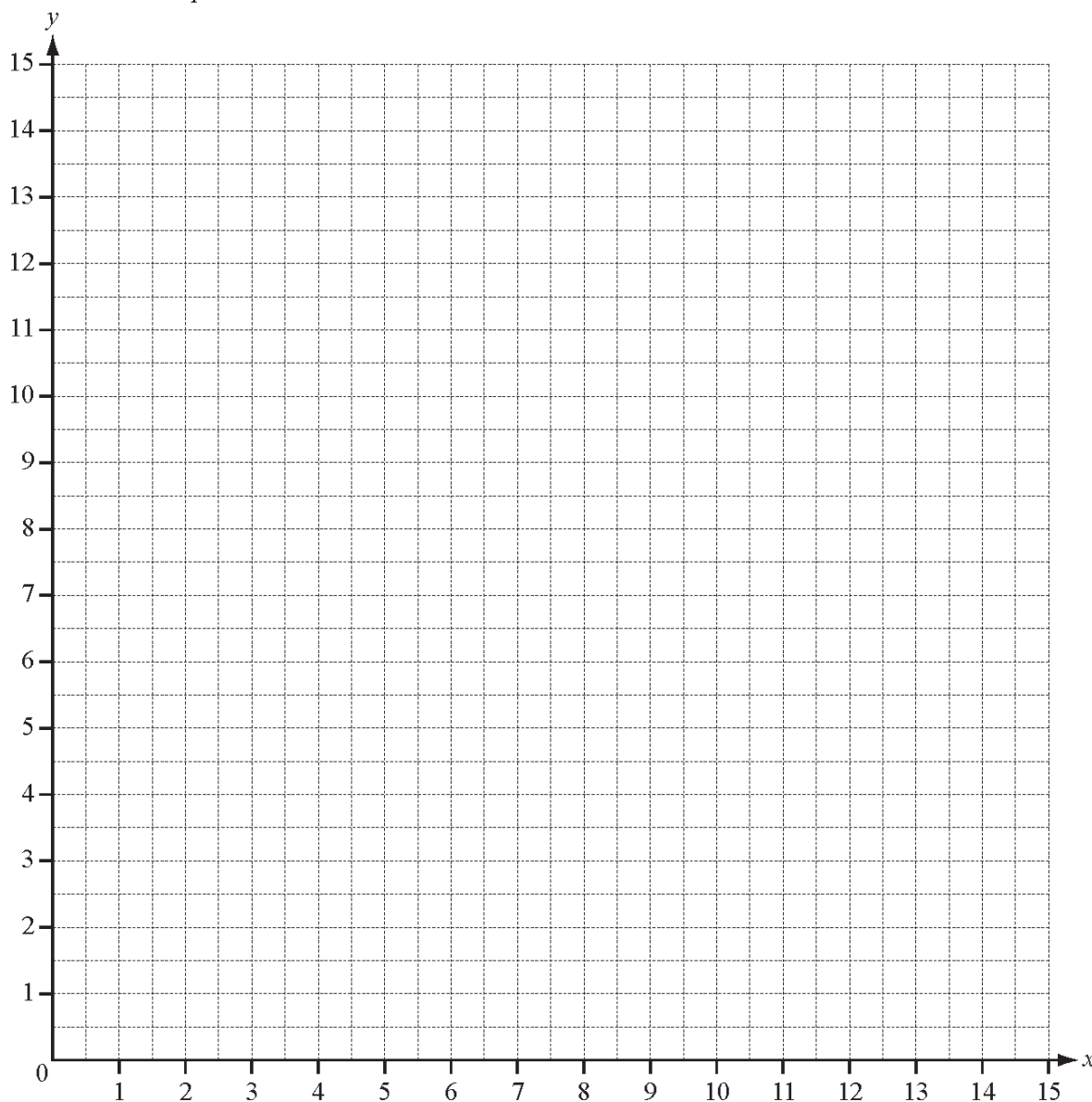
Answer(a)(i)

.....

.....

..... [4]

(ii) Draw four lines on the grid and write the letter R in the region which represents these inequalities.



[5]
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(b) The price of the small box is \$20 and the price of the large box is \$45.

(i) What is the greatest amount of money he receives when he sells all the boxes he has made?

Answer(b)(i) \$ [2]

(ii) For this amount of money, how many boxes of each size did he make?

Answer(b)(ii) small boxes and large boxes [1]

538 - (0580-S 2013-Paper 4 (Extended)/3-Q3) - LINEAR PROGRAMMING

(a) Luk wants to buy x goats and y sheep.

(i) He wants to buy at least 5 goats.

Write down an inequality in x to represent this condition.

Answer(a)(i) [1]

(ii) He wants to buy at least 11 sheep.

Write down an inequality in y to represent this condition.

Answer(a)(ii) [1]

(iii) He wants to buy at least 20 animals.

Write down an inequality in x and y to represent this condition.

Answer(a)(iii) [1]

(b) Goats cost \$4 and sheep cost \$8.

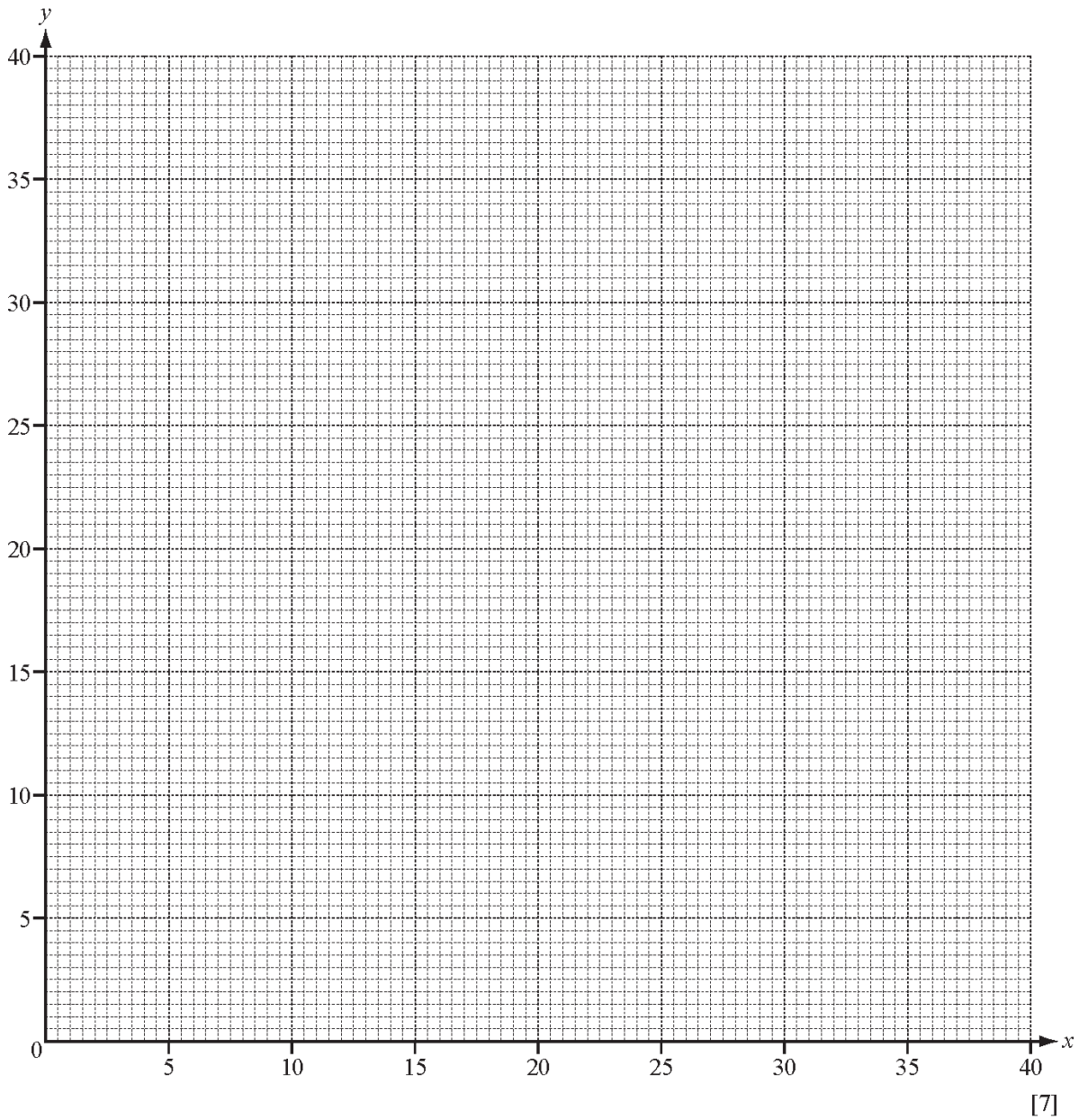
The maximum Luk can spend is \$160.

Write down an inequality in x and y and show that it simplifies to $x + 2y \leq 40$.

Answer(b)

[1]

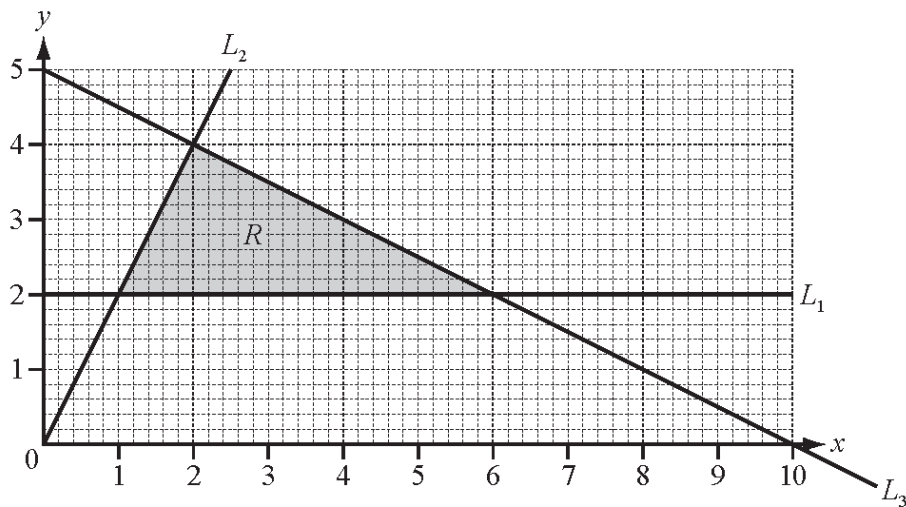
(c) (i) On the grid below, draw four lines to show the four inequalities and shade the unwanted regions.



(ii) Work out the maximum number of animals that Luk can buy.

Answer(c)(ii) [2]

539 - (0580-W 2013-Paper 4 (Extended)/1-Q9) - LINEAR PROGRAMMING



(a) Find the equations of the lines L_1, L_2 and L_3 .

Answer(a) L_1

L_2

L_3 [5]

(b) Write down the three inequalities that define the shaded region, R .

Answer(b)

.....

..... [3]

(c) A gardener buys x bushes and y trees.
 The cost of a bush is \$30 and the cost of a tree is \$200.
 The shaded region R shows the only possible numbers of bushes and trees the gardener can buy.

(i) Find the number of bushes and the number of trees when the total cost is \$720.

Answer(c)(i) bushes
 trees [2]

(ii) Find the number of bushes and the number of trees which give the greatest possible total cost.
 Write down this greatest possible total cost.

Answer(c)(ii) bushes
 trees
 Greatest possible total cost = \$ [3]

540 - (0580-S 2015-Paper 4 (Extended)/2-Q8) - LINEAR PROGRAMMING

Sima sells x biscuits and y cakes.

- (a) (i) She sells at least 100 biscuits.

Write down an inequality in x .

Answer(a)(i) [1]

- (ii) She sells at least 120 cakes.

Write down an inequality in y .

Answer(a)(ii) [1]

- (iii) She sells a maximum of 300 biscuits and cakes altogether.

Write down an inequality in x and y .

Answer(a)(iii) [1]

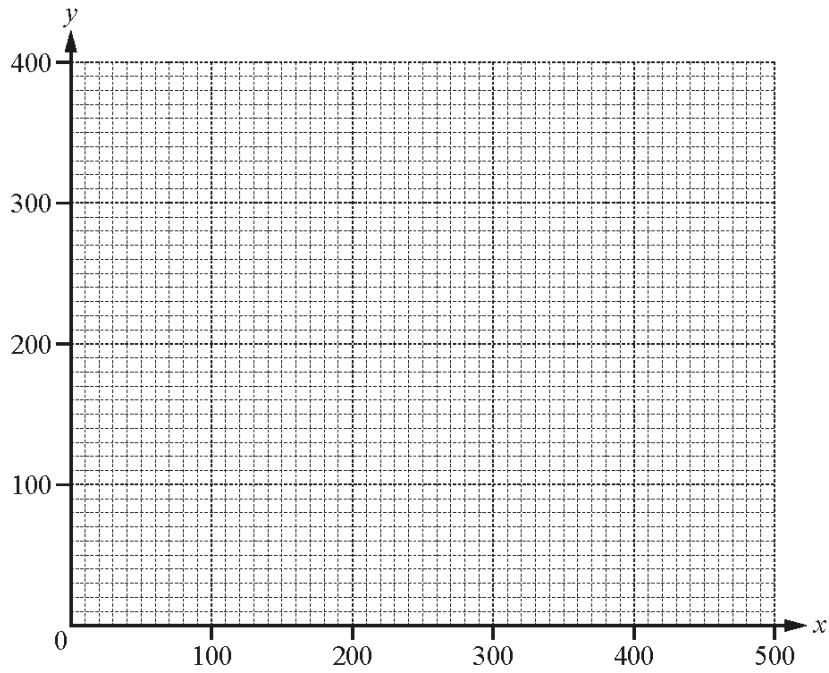
- (iv) Sima makes a profit of 40 cents on each biscuit and 80 cents on each cake.
Her total profit is at least \$160.

Show that $x + 2y \geq 400$.

Answer(a)(iv)

[1]

(b) On the grid, draw four lines to show the four inequalities and shade the unwanted regions.



[6]

(c) Calculate Sima's maximum profit.
Give your answer in dollars.

Answer(c) \$ [2]

541 - (0580-W 2015-Paper 4 (Extended)/1-Q4) - LINEAR PROGRAMMING

Ali buys x rose bushes and y lavender bushes.

He buys:

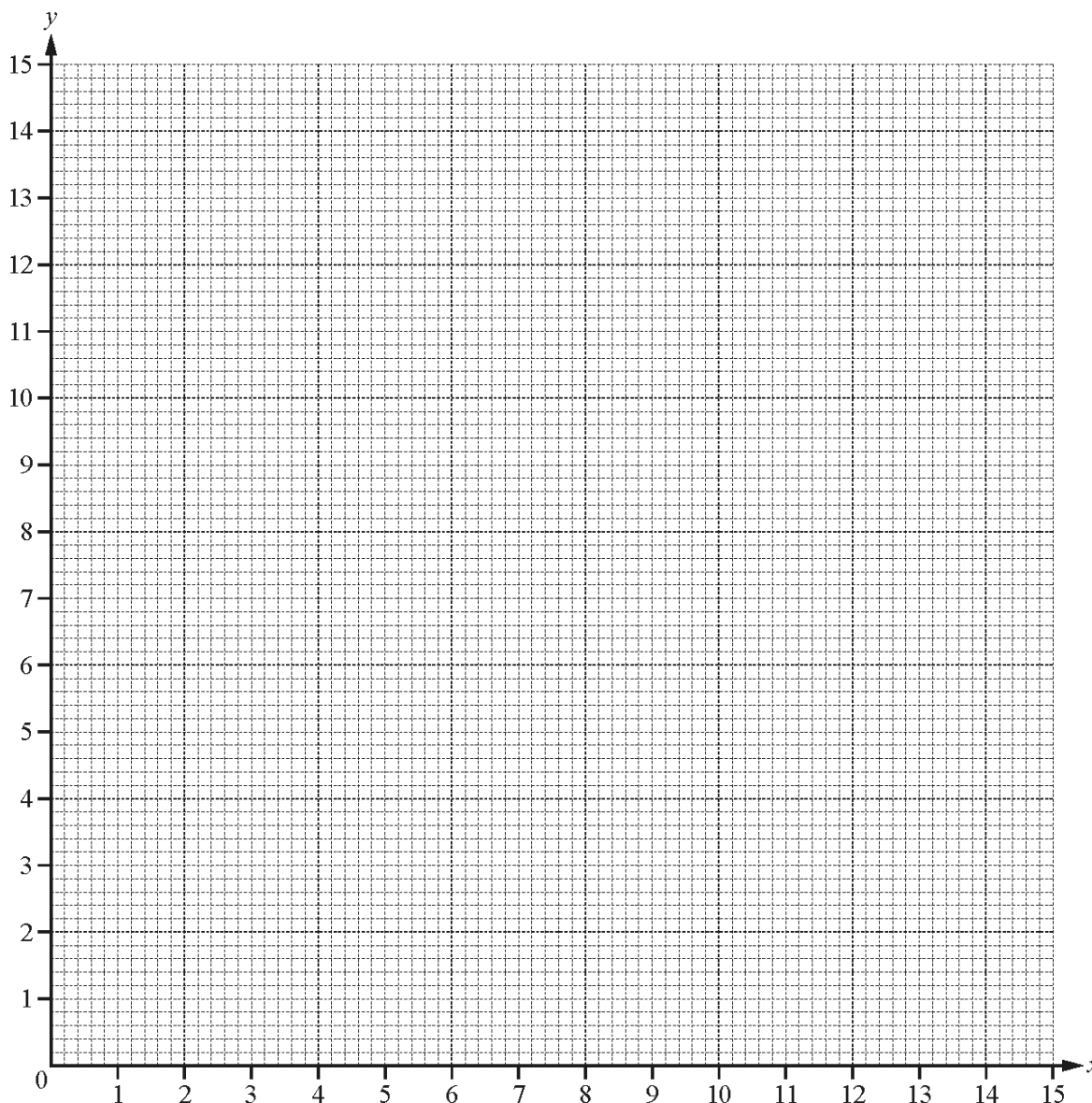
- at least 5 rose bushes
- at most 8 lavender bushes
- at most 15 bushes in total
- more lavender bushes than rose bushes.

(a) (i) Write down four inequalities, in terms of x and/or y , to show this information.

Answer(a)(i)

.....

(ii) On the grid, show the information in part (a)(i) by drawing four straight lines. Label the region R where all four inequalities are true.



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(b) Rose bushes cost \$6 each and lavender bushes cost \$4.50 each.

What is the greatest amount of money Ali could spend?

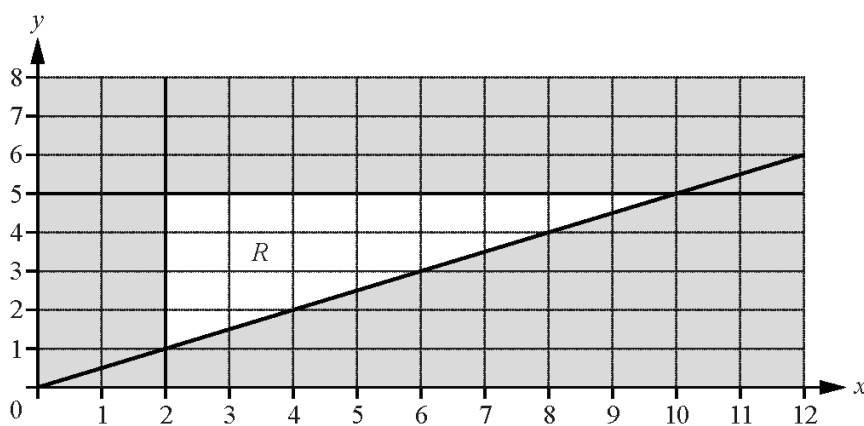
Answer(b) \$ [2]

542 - (0580-S 2018-Paper 4 (Extended)/3-Q9) - LINEAR PROGRAMMING

- (a) Find the equation of the straight line that is perpendicular to the line $y = \frac{1}{2}x + 1$ and passes through the point (1, 3).

..... [3]

(b)



- (i) Find the three inequalities that define the region R .

.....

 [4]

- (ii) Find the point (x, y) , with integer co-ordinates, inside the region R such that $3x + 5y = 35$.

(..... ,) [2]

543 - (0580-W 2019-Paper 4 (Extended)/1-Q9) - LINEAR PROGRAMMING

A car hire company has x small cars and y large cars.
 The company has at least 6 cars in total.
 The number of large cars is less than or equal to the number of small cars.
 The largest number of small cars is 8.

(a) Write down three inequalities, in terms of x and/or y , to show this information.

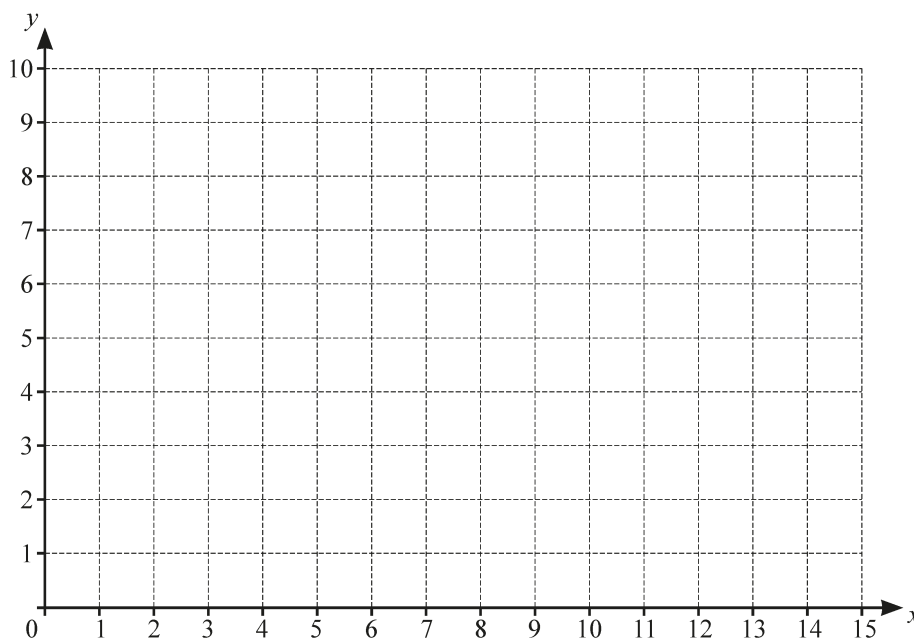
..... , [3]

(b) A small car can carry 4 people and a large car can carry 6 people.
 One day, the largest number of people to be carried is 60.

Show that $2x + 3y \leq 30$.

[1]

(c)



By shading the **unwanted** regions on the grid, show and label the region R that satisfies all four inequalities. [6]

(d) (i) Find the number of small cars and the number of large cars needed to carry exactly 60 people.

..... small cars, large cars [1]

(ii) When the company uses 7 cars, find the largest number of people that can be carried.

..... [2]