

**Answer the whole of this question on a sheet of graph paper.**

A taxi company has “SUPER” taxis and “MINI” taxis.

One morning a group of 45 people needs taxis.

For this group the taxi company uses  $x$  “SUPER” taxis and  $y$  “MINI” taxis.

A “SUPER” taxi can carry 5 passengers and a “MINI” taxi can carry 3 passengers.

So  $5x + 3y \geq 45$ .

- (a) The taxi company has 12 taxis.  
Write down **another** inequality in  $x$  and  $y$  to show this information. [1]
- (b) The taxi company always uses at least 4 “MINI” taxis.  
Write down an inequality in  $y$  to show this information. [1]
- (c) Draw  $x$  and  $y$  axes from 0 to 15 using 1 cm to represent 1 unit on each axis. [1]
- (d) Draw three lines on your graph to show the inequality  $5x + 3y \geq 45$  **and** the inequalities from **parts (a) and (b)**.  
Shade the **unwanted** regions. [6]
- (e) The cost to the taxi company of using a “SUPER” taxi is \$20 and the cost of using a “MINI” taxi is \$10.  
The taxi company wants to find the cheapest way of providing “SUPER” and “MINI” taxis for this group of people.  
Find the **two** ways in which this can be done. [3]
- (f) The taxi company decides to use 11 taxis for this group.  
(i) The taxi company charges \$30 for the use of each “SUPER” taxi and \$16 for the use of each “MINI” taxi.  
Find the two possible **total** charges. [3]
- (ii) Find the largest possible **profit** the company can make, using 11 taxis. [1]

A company has a vehicle parking area of  $1200 \text{ m}^2$  with space for  $x$  cars and  $y$  trucks.

Each car requires  $20 \text{ m}^2$  of space and each truck requires  $100 \text{ m}^2$  of space.

(a) Show that  $x + 5y \leq 60$ .

*Answer(a)*

[1]

(b) There must also be space for

(i) at least 40 vehicles,

(ii) at least 2 trucks.

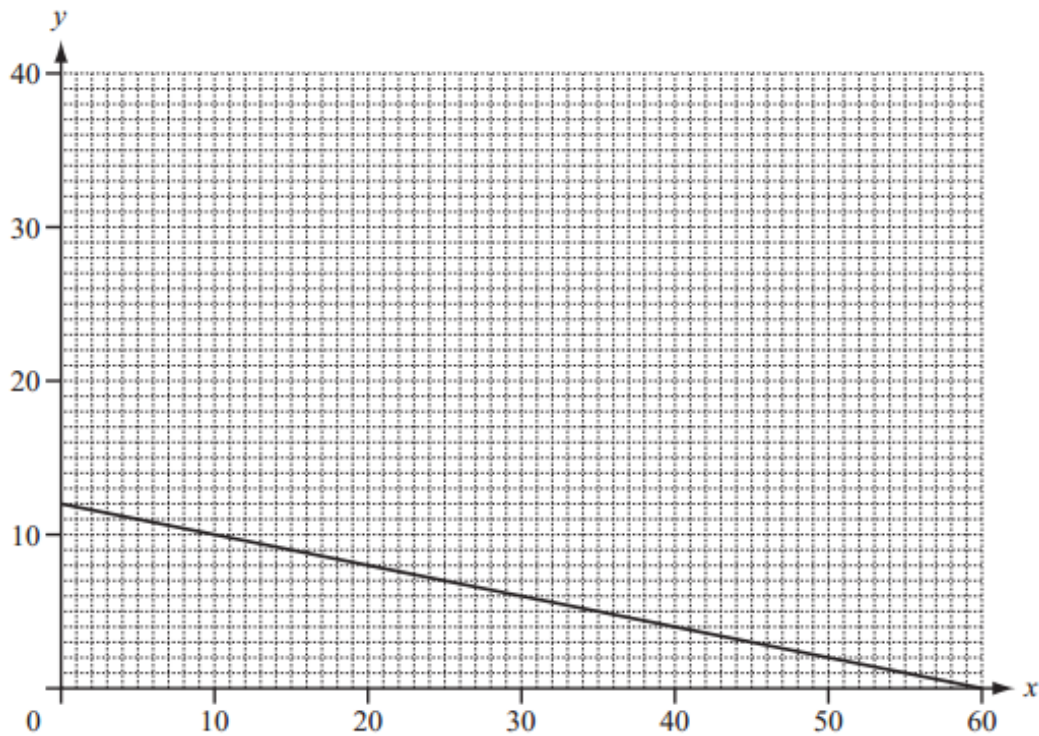
Write down two more inequalities to show this information.

*Answer(b)(i)* ..... [1]

*Answer(b)(ii)* ..... [1]

(c) One line has been drawn for you.

On the grid, show the three inequalities by drawing the other two lines and shading the **unwanted** regions.



[4]