FORM 4

CHAPTER 6

Self Test 1

1 (a) Let x = number of breads
y = number of boxes of juices
$0.80x + 1.80y \leqslant 50$
$8x + 18y \leqslant 500$
$4x + 9y \leqslant 250$

(b) Let x = number of 1 kg of rambutan
y = number of 1 kg of langsat
$5x + 3y \leqslant 50$

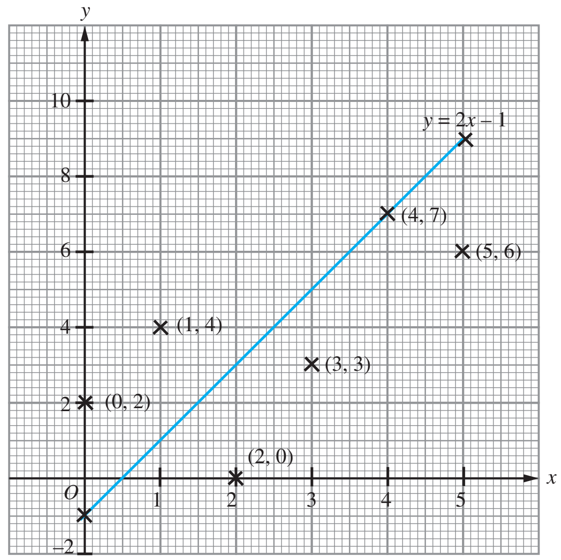
(c) Let x = number of packets of *nasi lemak*
y = number of packets of fried noodles
$4x + 3y \geqslant 200$

(d) Let x = number of female students
y = number of male students
$x + y \leqslant 3(40)$
$x + y \leqslant 120$

2

x	0	5
y	–1	9

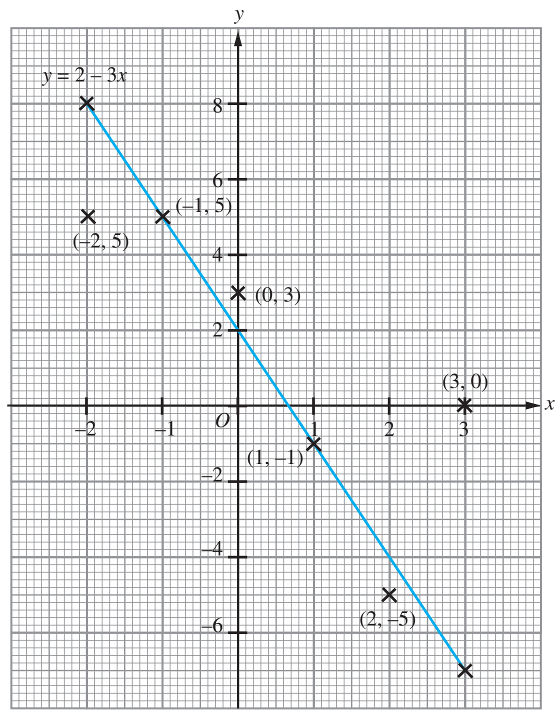
Points that satisfy
$y = 2x - 1$ is (4, 7).
$y > 2x - 1$ are (0, 2) and (1, 4).
$y < 2x - 1$ are (2, 0), (3, 3) and (5, 6).



3

x	–2	3
y	8	–7

Points that satisfy
$y = 2 - 3x$ are (–1, 5) and (1, –1).
$y > 2 - 3x$ are (0, 3) and (3, 0).
$y < 2 - 3x$ are (–2, 5) and (2, –5).



4 (a) When $x = 0$
$y = \frac{2}{5}(0) + 1$
$= 1$
y-coordinate, 1 = 1
$\therefore$ The point is on the straight line.
$\therefore$ Point (0, 1) satisfies $y = \frac{2}{5}x + 1$.

(b) When $x = 2$
$y = \frac{2}{5}(2) + 1$
$= 1.8$
y-coordinate, $4 > 1.8$
$\therefore$ The point is above the region of the straight line.
$\therefore$ Point (2, 4) satisfies $y > \frac{2}{5}x + 1$.

(c) When $x = 3$
$y = \frac{2}{5}(3) + 1$
$= 2.2$
y-coordinate, $1 < 2.2$
$\therefore$ The point is below the region of the straight line.
$\therefore$ Point (3, 1) satisfies $y < \frac{2}{5}x + 1$.

(d) When $x = 5$
$y = \frac{2}{5}(5) + 1$
$= 3$
y-coordinate, $5 > 3$
$\therefore$ The point is above the region of the straight line.
$\therefore$ Point (5, 5) satisfies $y > \frac{2}{5}x + 1$.

(e) When $x = 6$
$y = \frac{2}{5}(6) + 1$
$= 3.4$

y-coordinate, $1 < 3.4$

$\therefore$ The point is below the region of the straight line.

$\therefore$ Point (6, 1) satisfies $y < \frac{2}{5}x + 1$.

(f) When $x = 10$

$y = \frac{2}{5}(10) + 1$

$= 5$

y-coordinate, $5 = 5$

$\therefore$ The point is on the straight line.

$\therefore$ Point (10, 5) satisfies $y = \frac{2}{5}x + 1$.

5 (a) When $x = 0$

$y = -\frac{1}{2}(0) - 1$

$= -1$

y-coordinate, $1 > -1$

$\therefore$ The point is above the region of straight line.

$\therefore$ Point (0, 1) satisfies $y > -\frac{1}{2}x - 1$.

(b) When $x = 2$

$y = -\frac{1}{2}(2) - 1$

$= -2$

y-coordinate, $-2 = -2$

$\therefore$ The point is on the straight line.

$\therefore$ Point (2, −2) satisfies $y = -\frac{1}{2}x - 1$

(c) When $x = 4$

$y = -\frac{1}{2}(4) - 1$

$= -3$

y-coordinate, $-3 = -3$

$\therefore$ The point is on the straight line.

$\therefore$ Point (4, −3) satisfies $y = -\frac{1}{2}x - 1$.

(d) When $x = 5$

$y = -\frac{1}{2}(5) - 1$

$= -3.5$

y-coordinate, $-6 < -3.5$

$\therefore$ The point is below the region of the straight line.

$\therefore$ Point (5, −6) satisfies $y < -\frac{1}{2}x - 1$.

(e) When $x = 6$

$y = -\frac{1}{2}(6) - 1$

$= -4$

y-coordinate, $3 > -4$

$\therefore$ The point is above the region of the straight line.

$\therefore$ Point (6, 3) satisfies $y > -\frac{1}{2}x - 1$

(f) When $x = 3$

$y = -\frac{1}{2}(3) - 1$

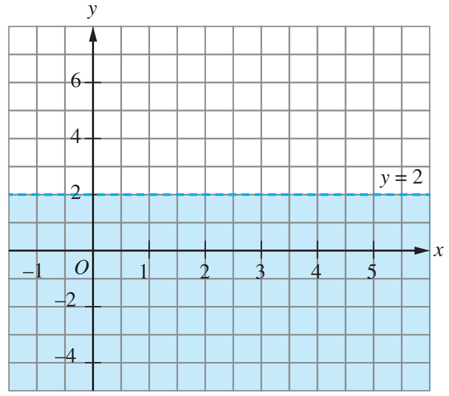
$= -2.5$

y-coordinate , $-5 < -2.5$

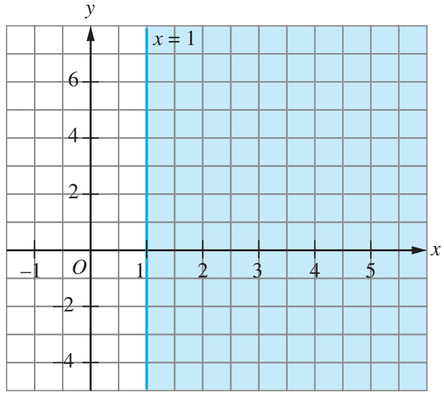
$\therefore$ The point is below the region of the straight line.

$\therefore$ Point (3, −5) satisfies $y < -\frac{1}{2}x - 1$.

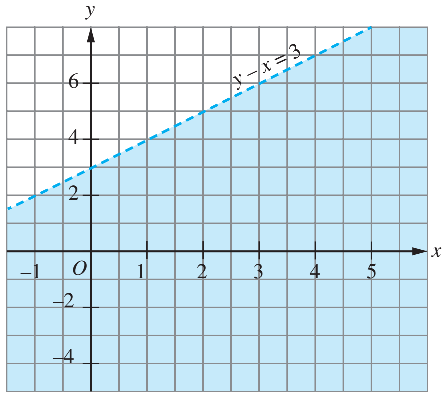
6 (a) $y < 2$



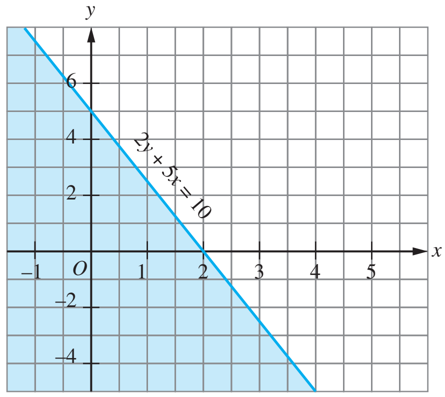
(b) $x \geqslant 1$



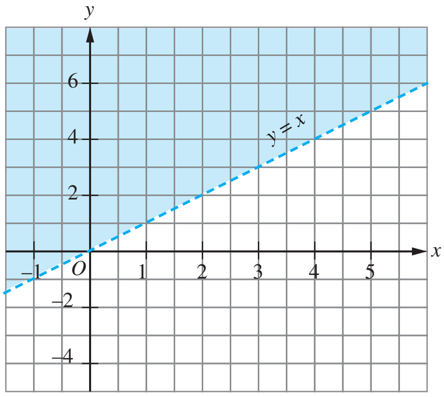
(c) $y - x < 3$



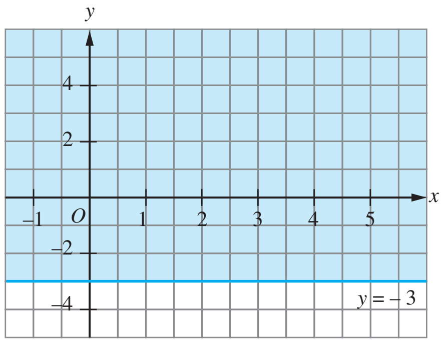
(d) $2y + 5x \leqslant 10$



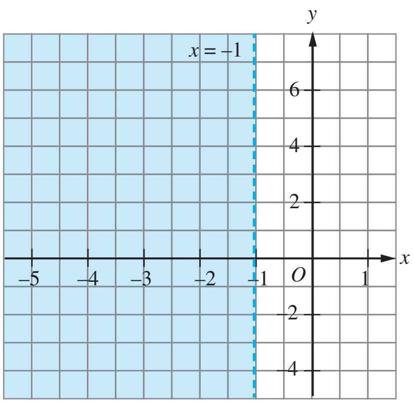
7 (a) $y > x$



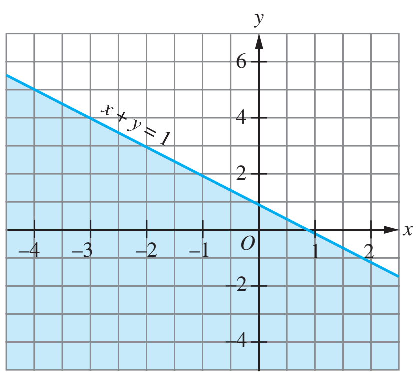
(b) $y \geqslant -3$



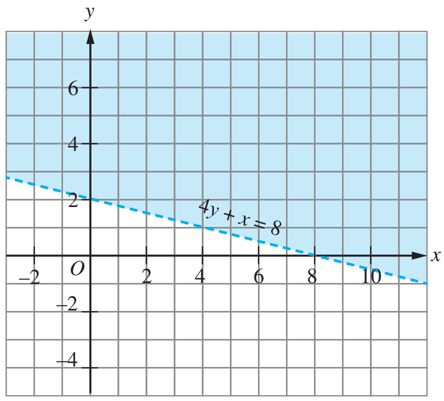
(c) $x < -1$



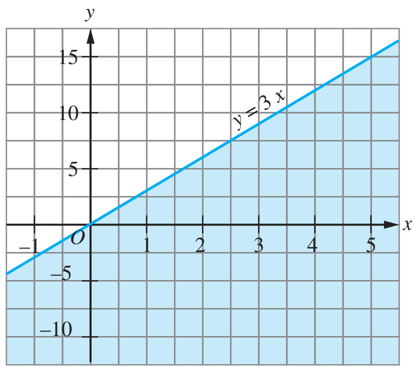
(d) $x + y \leqslant 1$



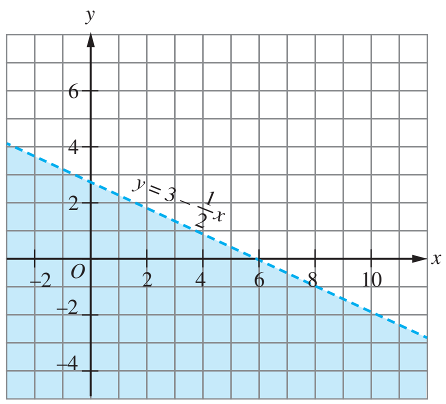
(e) $4y + x > 8$



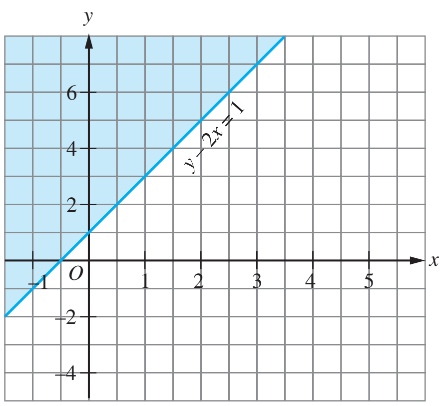
(f) $y \leqslant 3x$



(g) $y < 3 - \frac{1}{2}x$



(h) $y - 2x \geqslant 1$



Self Test 2

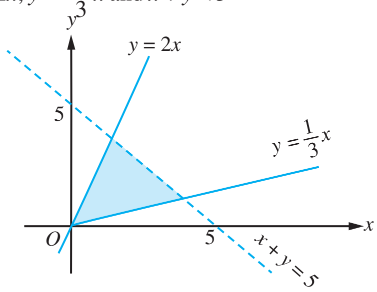
1 Let the number of cartons of fruit juices $= x$
the number of cartons of soya milk $= y$
(a) $21x + 30y \leqslant 100$
(b) $x \geqslant 2y$
(c) $24x + 24y \geqslant 40$
$3x + 3y \geqslant 5$

2 Let the number of *nasi lemak* $= x$
the number of fried noodles $= y$
(a) $x + y \leqslant 400$
(b) $x \leqslant 3y$
(c) $y \geqslant 100$

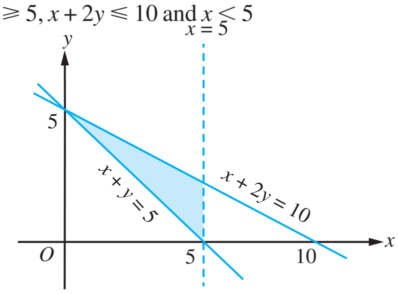
3 Let the number of female garment $= x$, the number of male garment $= y$
$60x + 80y \leqslant 1000 \Rightarrow 3x + 4y \leqslant 50$
$x + y \geqslant 10$
$x - y \geqslant 8$

4 (a) **A** (b) **D**
(c) **B** (d) **C**

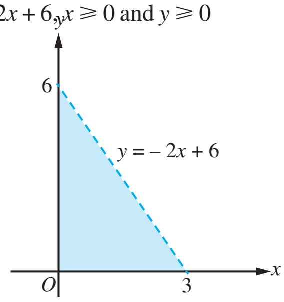
5 (a) $y \leqslant 2x$, $y \geqslant \frac{1}{3}x$ and $x + y < 5$



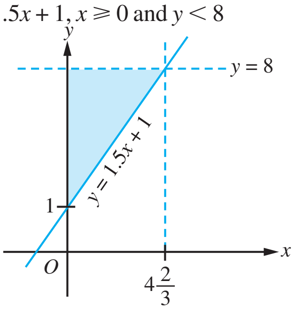
(b) $x + y \geqslant 5$, $x + 2y \leqslant 10$ and $x \leqslant 5$



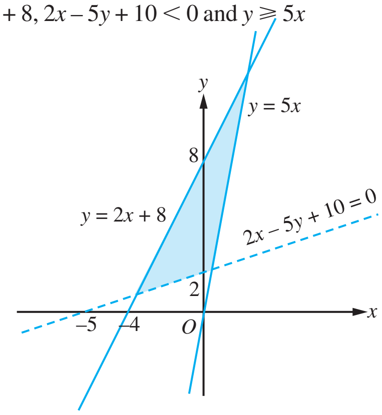
6 (a) $y < -2x + 6$, $x \geqslant 0$ and $y \geqslant 0$



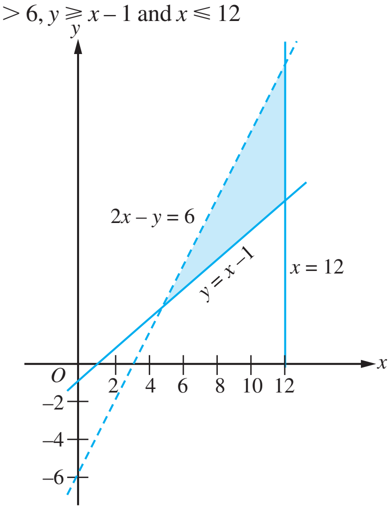
(b) $y \geqslant 1.5x + 1$, $x \geqslant 0$ and $y < 8$



(c) $y \leqslant 2x + 8$, $2x - 5y + 10 < 0$ and $y \geqslant 5x$

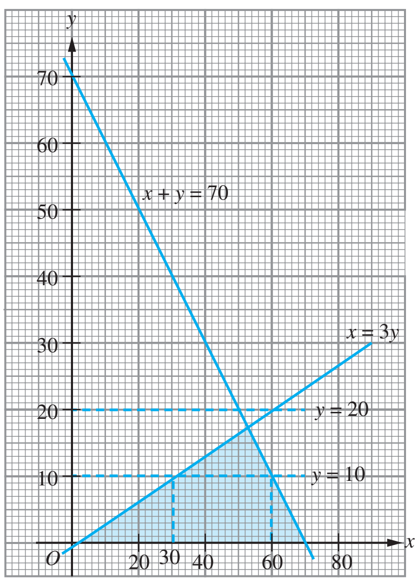


(d) $2x - y > 6$, $y \geqslant x - 1$ and $x \leqslant 12$



7 (a) Let $x =$ number of teachers
$y =$ number of parents
I $x + y \leqslant 70$
II $x \geqslant 3y$

(b)



(c) (i) When $y = 10$, the minimum number of teachers $= 30$, the maximum number of teachers $= 60$
(ii) The action does not comply with the constraints given. The value of $y = 20$ is outside the shaded region.

SPM PRACTICE

Paper 1

1 D

A LEFT $= 2(3) + 3(0)$
$= 6$

B LEFT $= 2(1) + 3(1)$
$= 5 < 6$

C LEFT $= 2(-1) + 3(1)$
$= 1 < 6$

D LEFT $= 2(2) + 3(1)$
$= 7 > 6$

2 D $s - 2t \leqslant 8$
$s \leqslant 2t + 8$

3 D

4 D

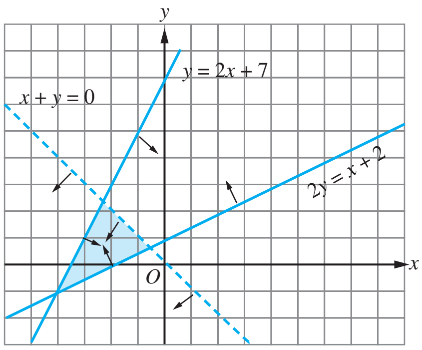
5 B $4.50x + 6.50y \leqslant 80$
$45x + 65y \leqslant 800$
$9x + 13y \leqslant 160$

6 A

Paper 2

Section A

1



2 I $x < 4$

II $m = \frac{3}{4}, c = 3.\ y \leqslant \frac{3}{4}x + 3$

III $m = \frac{3 - 0}{-4 - 4}$

$= -\frac{3}{8}$

Substitute $(-4, 3)$ into $y = -\frac{3}{8}x + c$

$3 = -\frac{3}{8}(-4) + c$

$c = \frac{3}{2}$

therefore, $y = -\frac{3}{8}x + \frac{3}{2}$

$y \geqslant -\frac{3}{8}x + \frac{3}{2}$

3 I $x + y \leqslant 50$

II $x \leqslant 3y$

III $x - \frac{1}{3}y \geqslant 15$

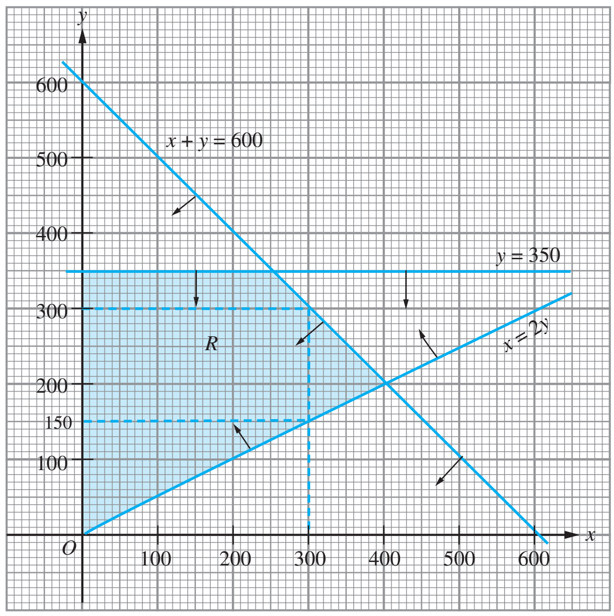
4

Coordinates	$x + y > 3$	$y - x \leqslant 5$	$y \geqslant 2x - 3$
(a) (1, 1)	$x + y = 1 + 1$ $= 2 \not> 3$ (1, 1) is not in the region of $x + y > 3$.	$y - x = 1 - 1$ $= 0 \leqslant 5$ (1, 1) is in the region of $y - x \leqslant 5$.	$2x - 3 = 2(1) - 3$ $= -1$ $1 > -1$ (1, 1) is in the region of $y \geqslant 2x - 3$.
(b) (–1, 4)	$x + y = -1 + 4$ $= 3 \not> 3$ (–1, 4) is not in the region of $x + y > 3$.	$y - x = 4 - (-1)$ $= 5 \leqslant 5$ (–1, 4) is in the region of $y - x \leqslant 5$.	$2x - 3 = 2(-1) - 3$ $= -5$ $4 > -5$ (–1, 4) is in the region of $y \geqslant 2x - 3$.

Section B

5 (a) I $x + y \leqslant 600$
II $y \leqslant 350$
III $x \leqslant 2y$

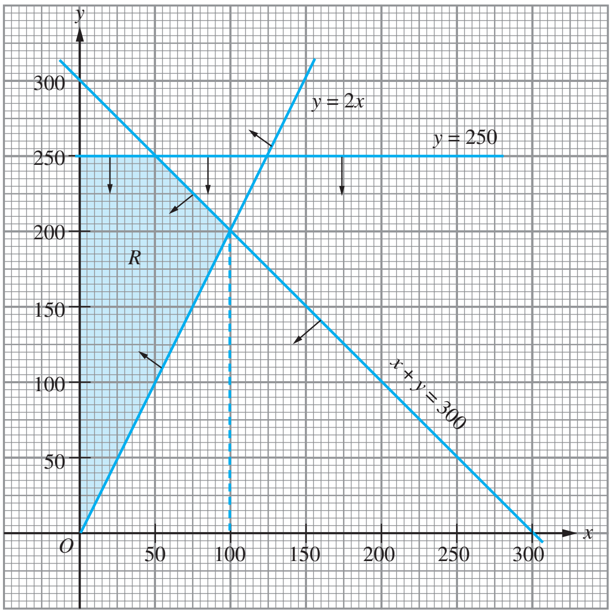
(b)



(c) When $x = 300$
$150 \leqslant y \leqslant 300$
Range of annual fees
$= (300 - 150) \times$ RM35 000
$=$ RM5 250 000

6 (a) I $x + y \leqslant 300$
II $y \geqslant 2x$
III $y \leqslant 250$

(b) (i)



(ii) Maximum number of small tiles, $x = 100$

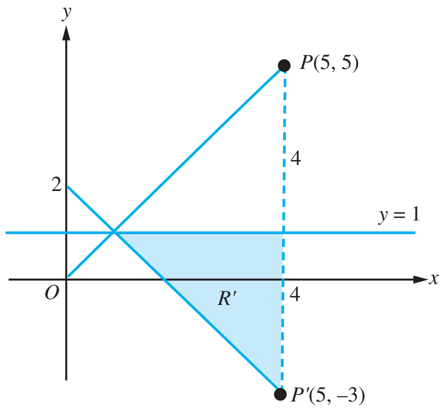
(c) This combination does not satisfy the system of linear inequalities because the point (200, 100) is outside the shaded region.

7 (a) I $y \geqslant 1$

II $x < 5$

III $y \leqslant x$

(b)



(c) I $x < 5$

II $y \leqslant 1$

III $m = \frac{2-(-3)}{0-5}$

$= -1$

$c = 2$

$y = -x + 2$

$\therefore y \geqslant -x + 2$