

Form 4: Chapter 6
Linear Inequalities in Two Variables
Fully-worked Solutions

UPSKILL 6.1

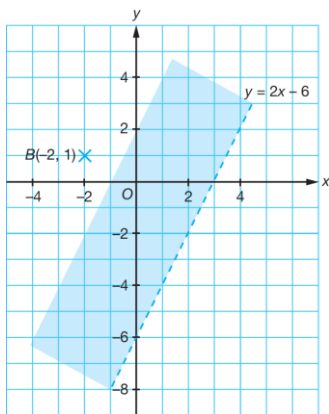
1 $6x + 3y \leq 54 \Rightarrow 2x + y \leq 18$

2 $35x + 30y \leq 390 \Rightarrow 7x + 6y \leq 78$

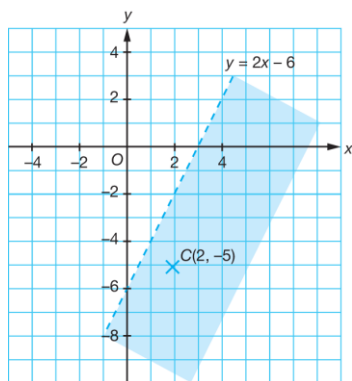
3 (a), (b), (c)

Point	y	$2x - 6$	Conclusion
A(2, -2)	-2	-2	$y = 2x - 6$
B(-2, 1)	1	-12	$y > 2x - 6$
C(2, -5)	-5	-2	$y < 2x - 6$

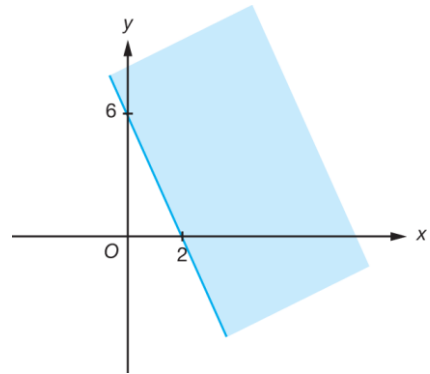
(d) (i) $y > 2x - 6$



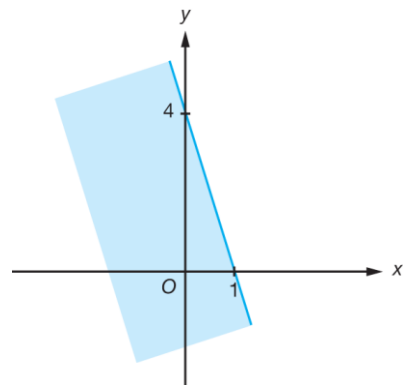
(ii) $y < 2x - 6$



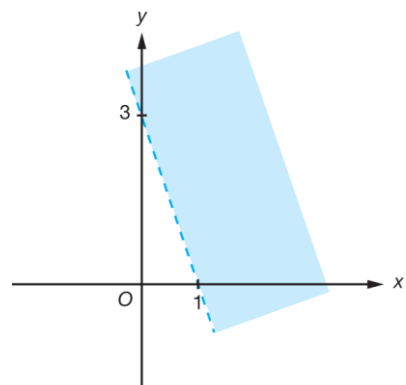
4 (a)



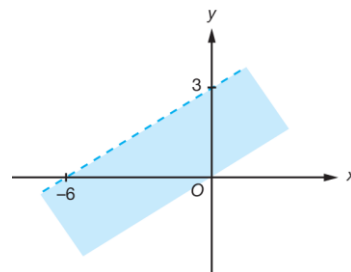
(b)



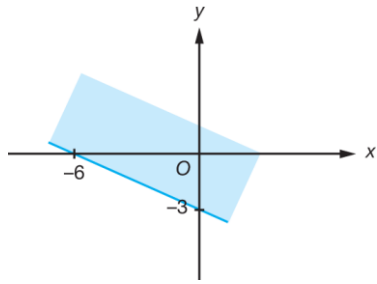
(c)



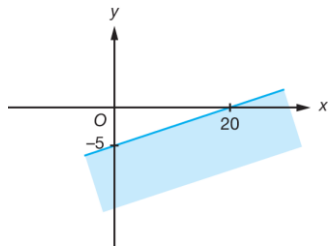
(d)



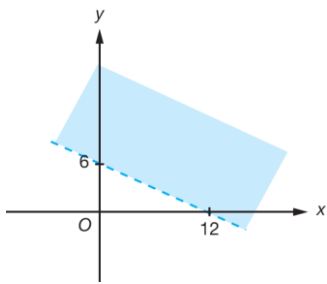
(e)



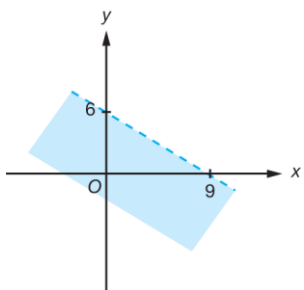
(f)



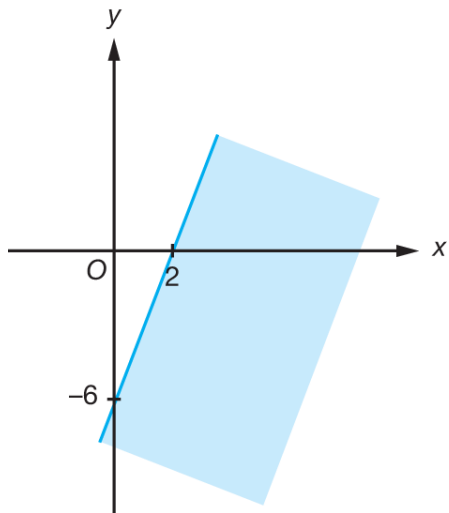
(g)



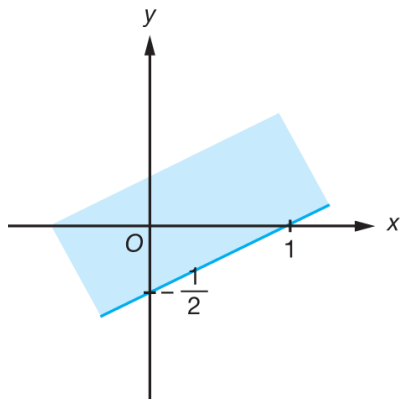
(h)



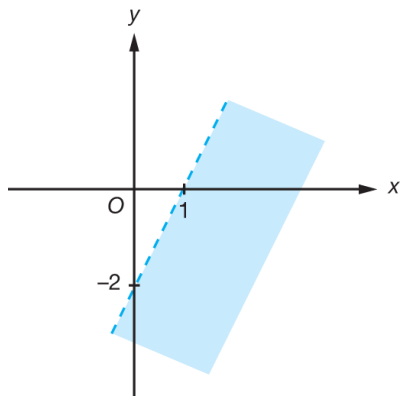
5 (a)



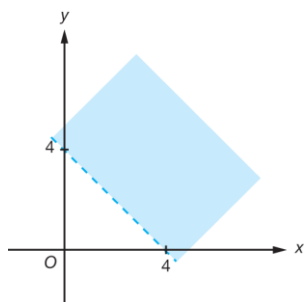
(b)



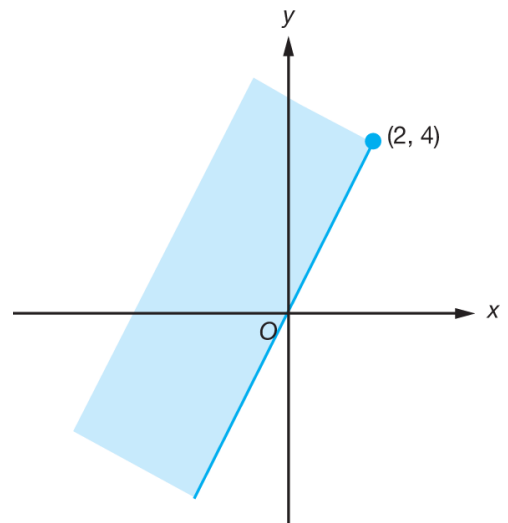
(c)



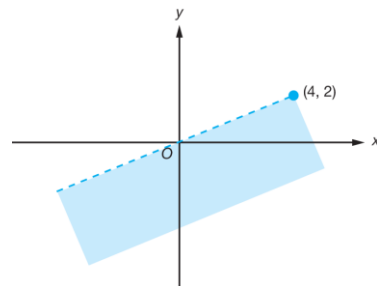
(d)



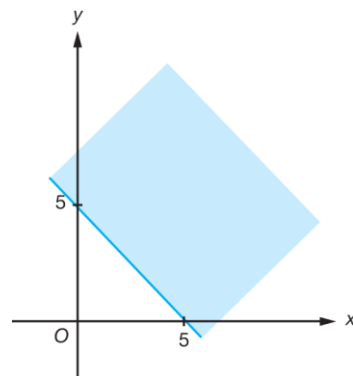
6 (a)



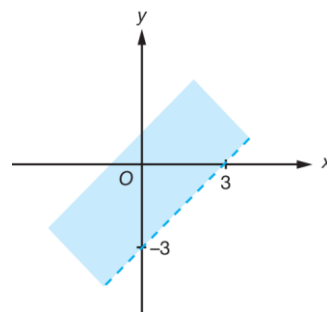
(b)



(c)



(d)



UPSKILL 6.2

1 $1500x + 900y \leq 45\,000 \Rightarrow 5x + 3y \leq 150,$

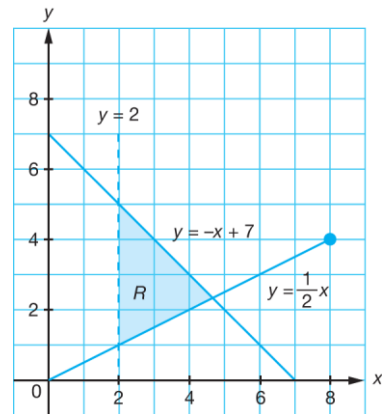
$y - x \leq 10, y \geq \frac{1}{10}x$

2 $x \geq 10, y \geq 2x,$

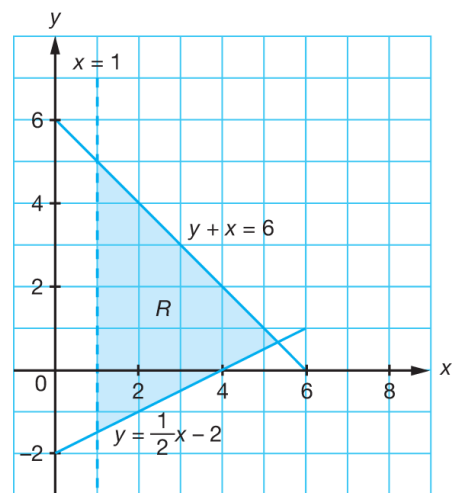
$8x + 12y \leq 12 \times 60 \Rightarrow 2x + 3y \leq 180$

3 $x + y \leq 90, x \leq 2y, y - x \leq 10$

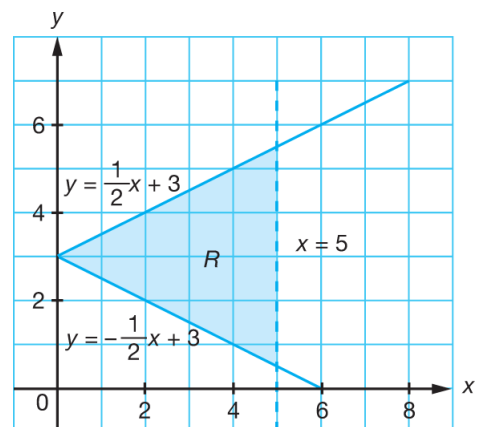
4 (a)



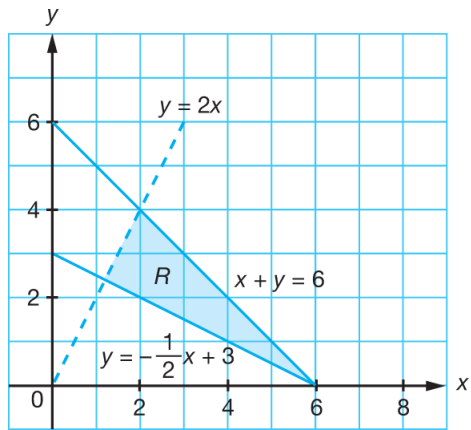
(b)



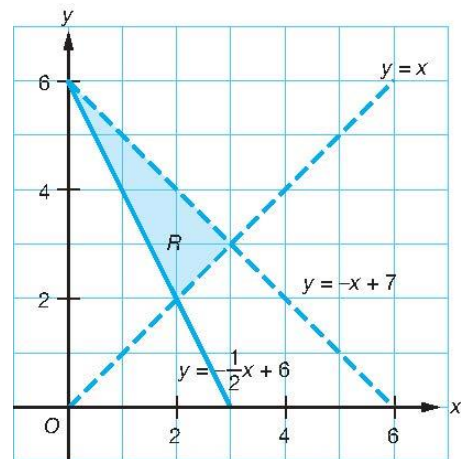
(c)



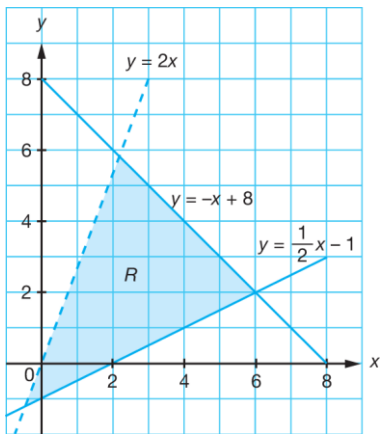
(d)



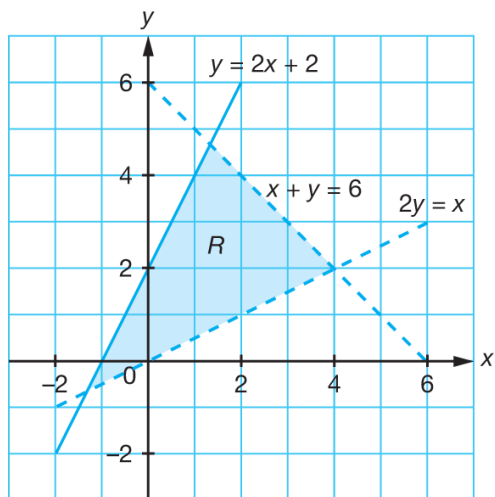
(g)



(e)

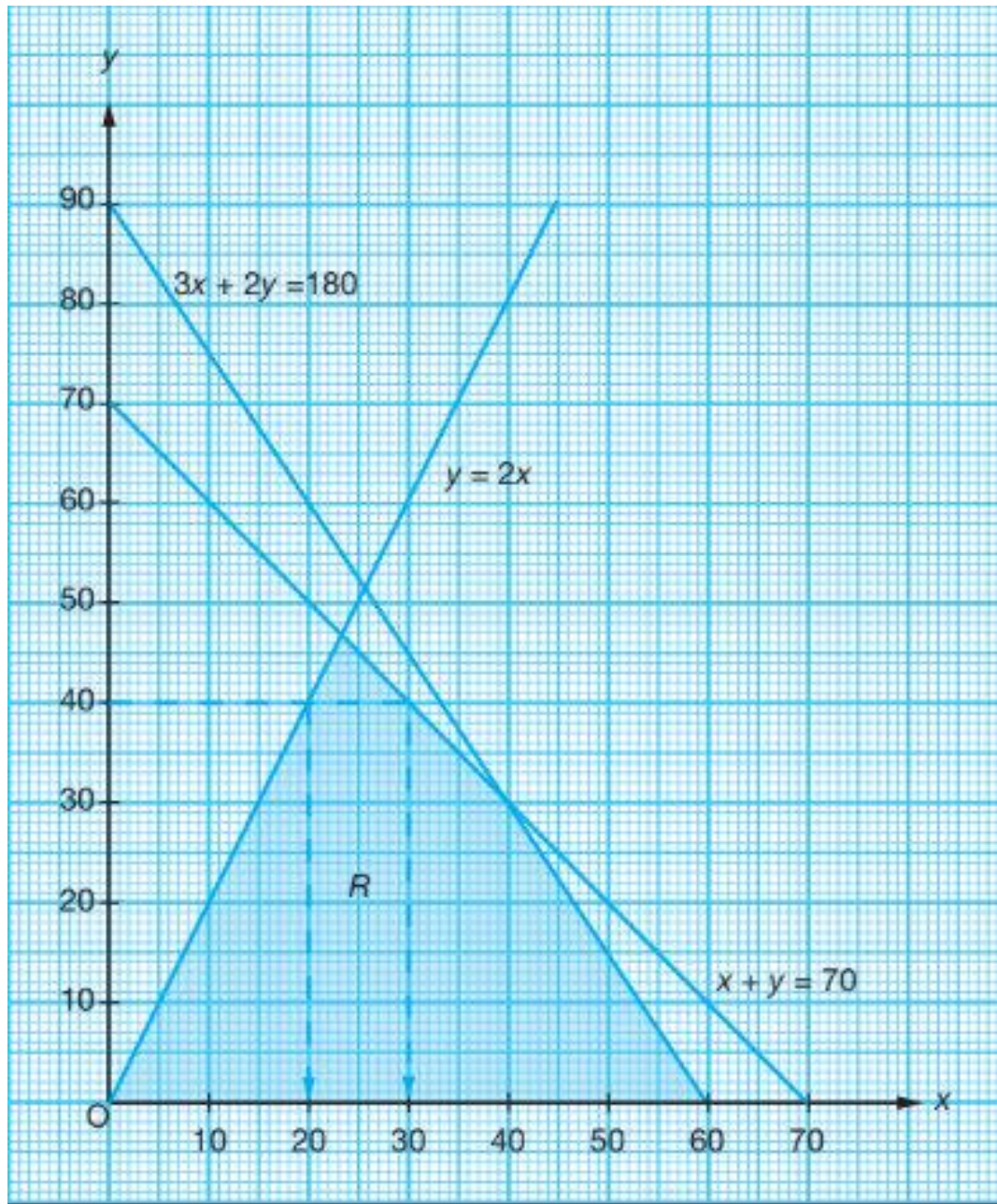


(f)



5 (a) $x + y \leq 70$, $y \leq 2x$, $90x + 60y \leq 5400 \Rightarrow 3x + 2y \leq 180$

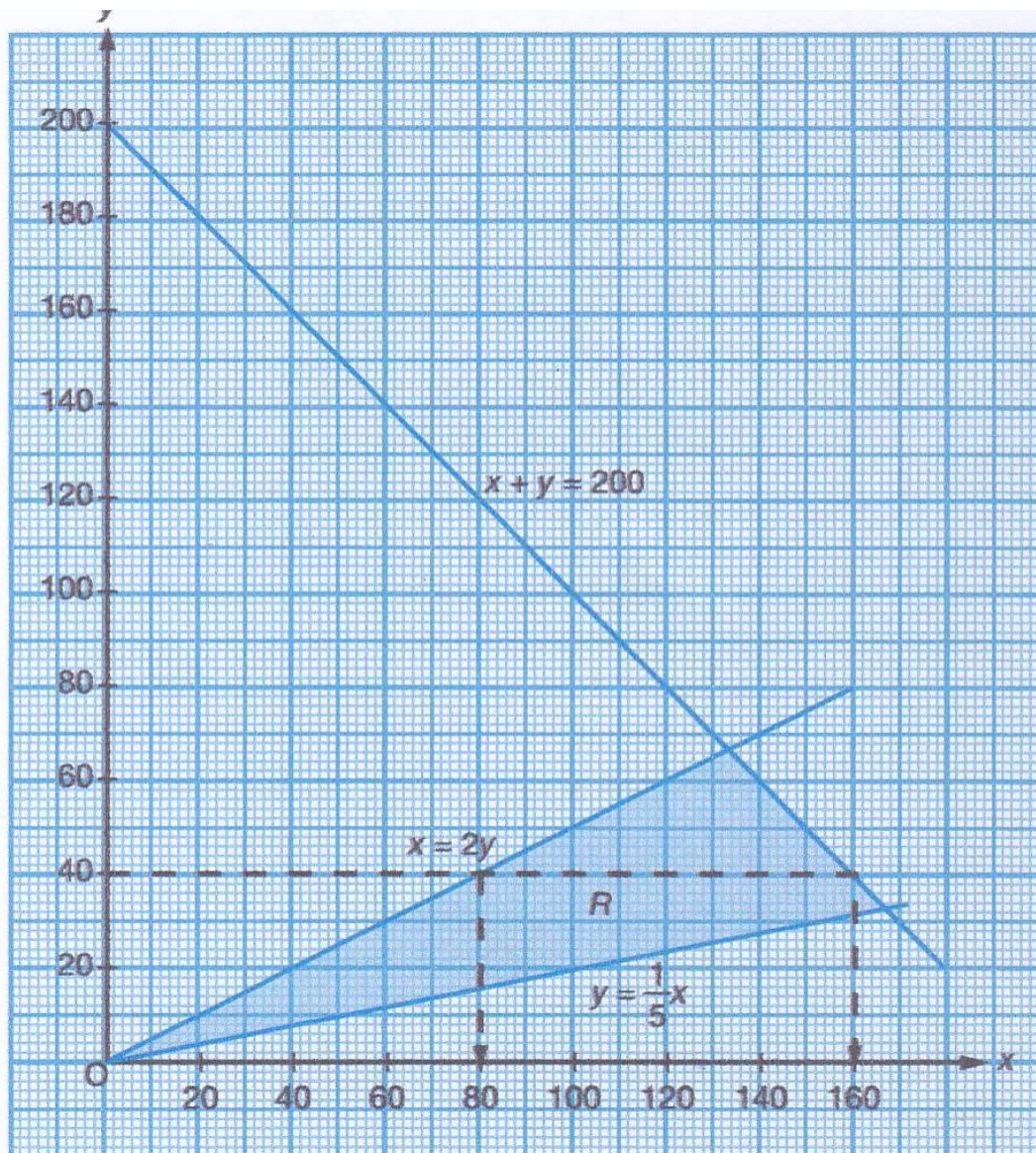
(b)



- (c) If 40 STPM students attend the camp, draw the straight line $y = 40$.
From the graph, the minimum and maximum numbers of the SPM students who attend the camp are 20 and 30 respectively.

6 (a) $x \geq 2y$, $x + y \leq 200$, $y \geq \frac{1}{5}x$

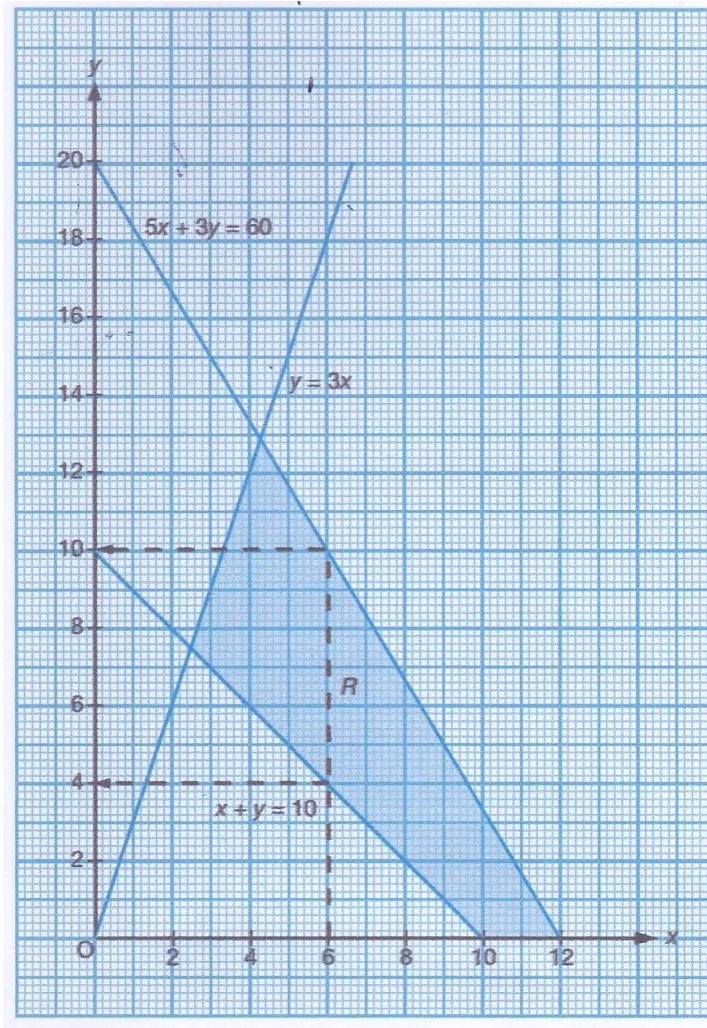
(b)



- (c) If there are 40 deluxe members, draw the straight line $y = 40$.
From the graph, the minimum and maximum numbers of the ordinary members are 80 and 160 respectively.

7 (a) $x + y \geq 10$, $y \leq 3x$, $150x + 90y \leq 1800 \Rightarrow 5x + 3y \leq 60$

(b)



(c) If 6 vans are used, draw the straight line $x = 6$. From the graph, the minimum and maximum numbers of motorcycles that are used are 4 and 10 respectively.

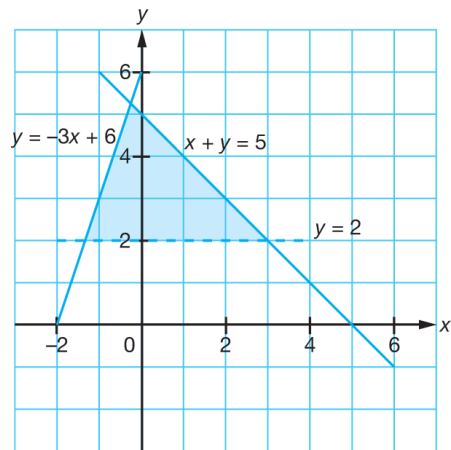
Summative Practice 6

Multiple-Choice Questions

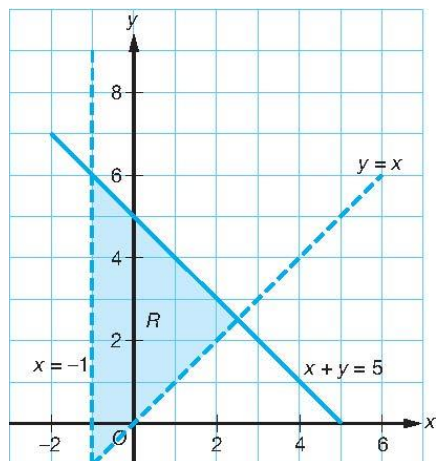
- 1 The inequality that does not represent the shaded region is $3x < y$.
Answer: B
- 2 The inequality that does not represent the shaded region is $y \leq 2x + 3$.
Answer: B
- 3 The inequality that does not represent the shaded region is $3x < y$.
Answer: A
- 4 The inequality that does not represent the shaded region is $2x \leq y$.
Answer: C

Structured Questions

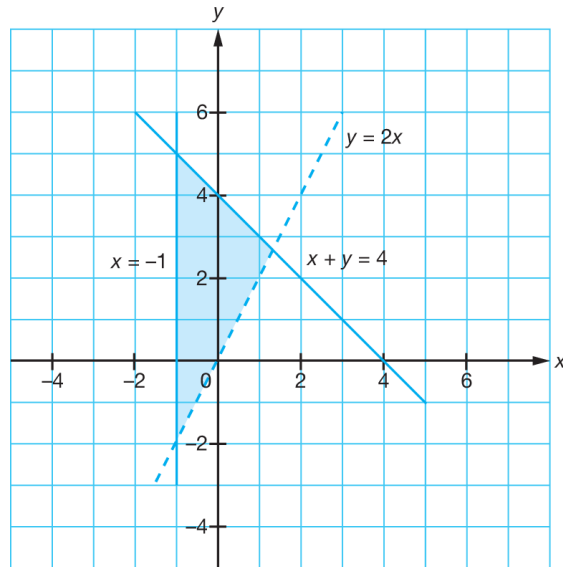
1



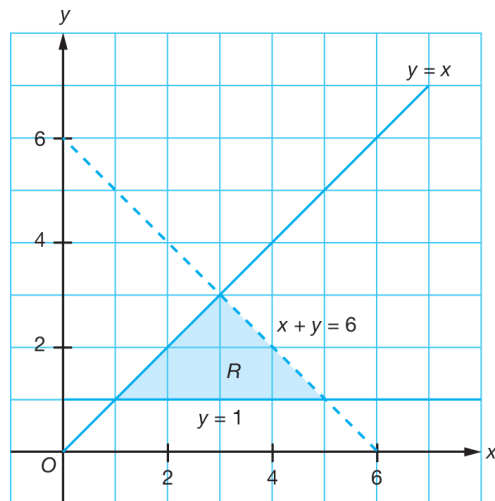
2



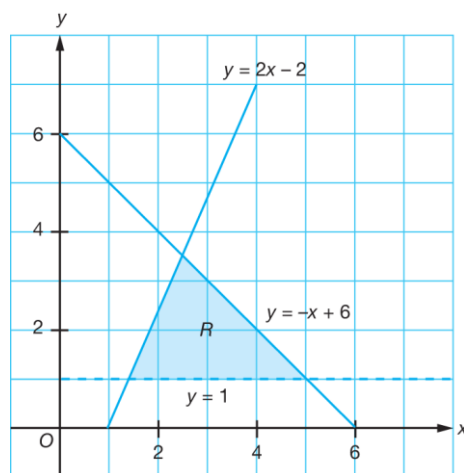
3



4 (a)



(b)



5 (a) $x > 1$, $y \geq \frac{1}{2}x$, $x + y \leq 5$

(b) $y < x$, $x + y \leq 6$, $y \leq -\frac{1}{2}x + 4$

6 (a) $10x + 20y \leq 500 \Rightarrow x + 2y \leq 50$, $15x + 40y \geq 600 \Rightarrow 3x + 8y \geq 120$, $y - 2x \leq 10$

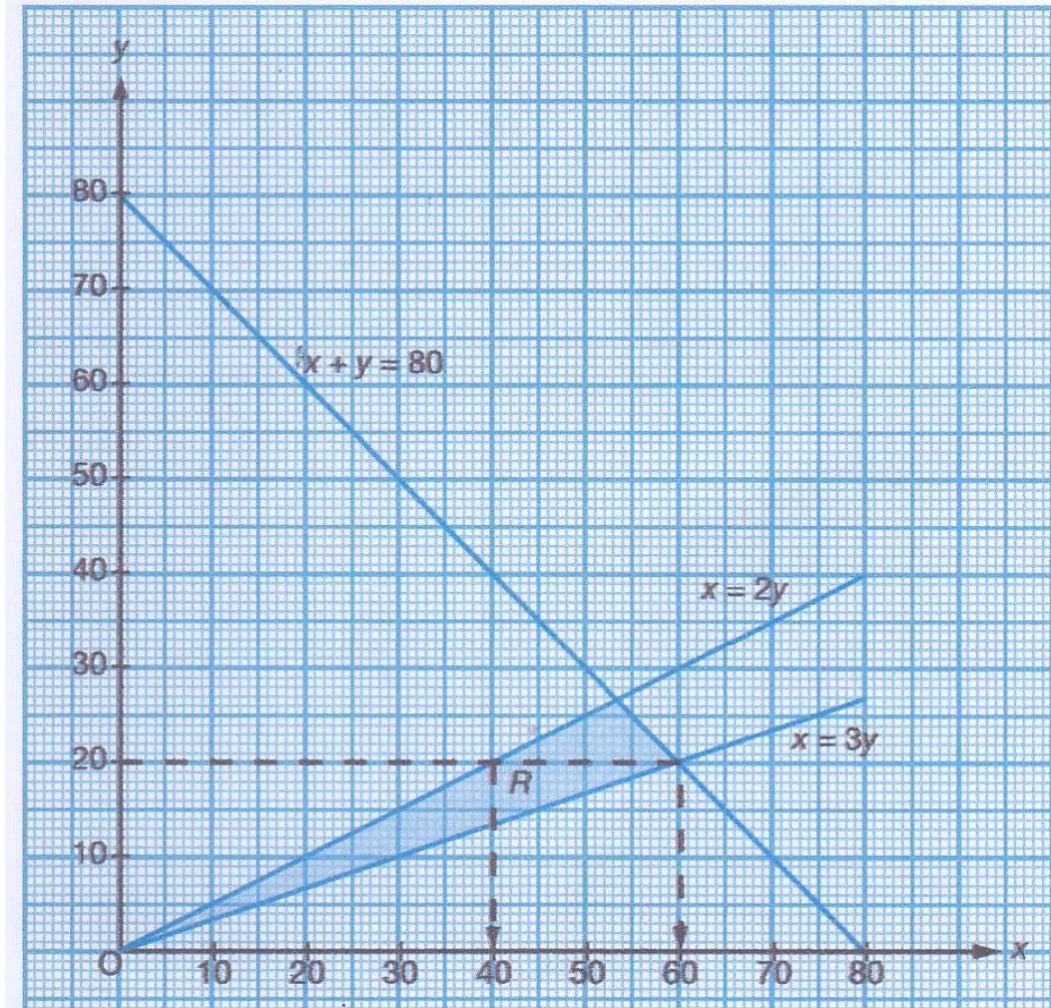
(b)



- (c) If 15 units of food K is prepared, draw the straight line $y = 15$.
From the graph, the maximum unit of food H that is prepared is 20.

7 (a) $x + y \leq 80$, $x \leq 3y$, $x \geq 2y$

(b)

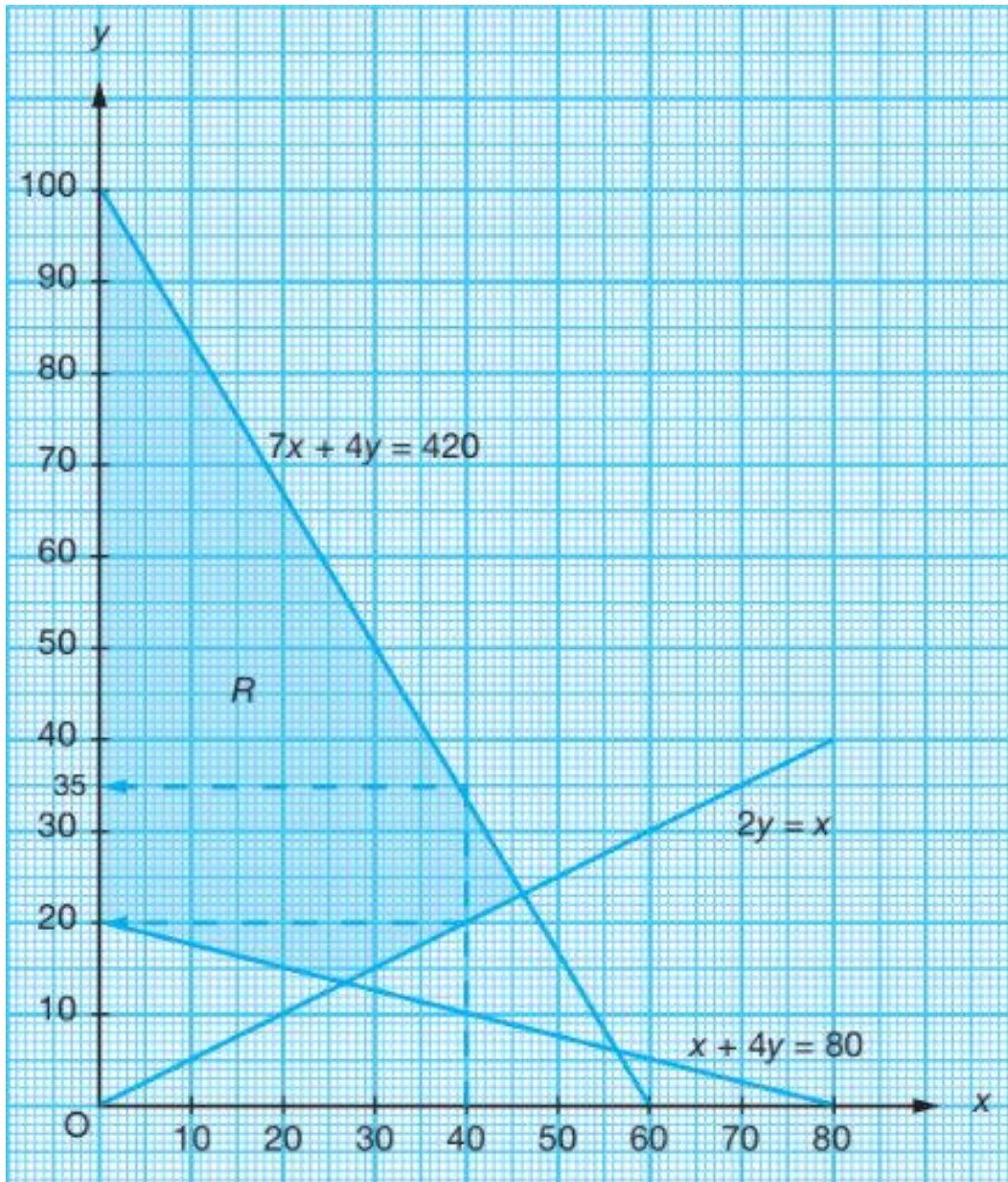


(c) If the number of participants of course Q is 20, draw the straight line $y = 20$.

From the graph, the minimum and maximum numbers of the course P participants are 40 and 60 respectively.

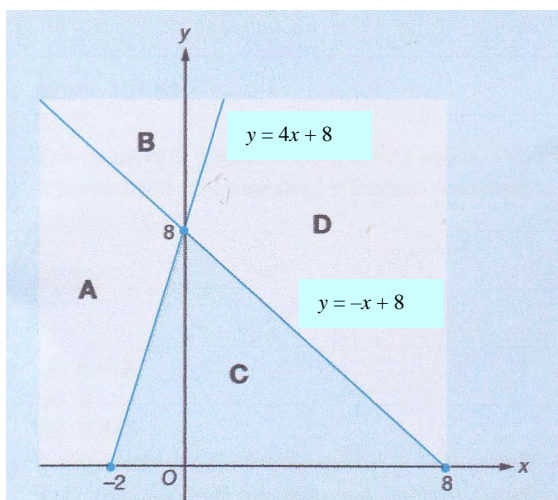
8 (a) $70x + 40y \leq 4200 \Rightarrow 7x + 4y \leq 420$, $20x + 80y \geq 1600 \Rightarrow x + 4y \geq 80$, $y \geq \frac{1}{2}x$

(b)



(c) If the factory produces 40 boxes of chocolate ice-cream, draw the straight line, $x = 40$.
From the graph, the minimum and maximum number of boxes of the strawberry ice-cream that produced are 20 and 35 respectively.

1



The equation of the straight line joining $(-2, 0)$ and $(8, 0)$ is $y = \frac{8}{2}x + 8$, which is $y = 4x + 8$.

The region above this straight line is required.

The equation of the straight line joining $(0, 8)$ and $(8, 0)$ is $y = -\frac{8}{8}x + 8$, which is $y = -x + 8$ or $x + y = 8$.

The region below this straight line is required.

Hence, the region which satisfies $y \geq 4x + 8$ and $x + y \leq 8$ is the region **A**.

Answer: A

2 $y \geq 0$, $y \geq x + 8$, $y \leq \frac{2}{3}x + 8$, $y < -x$

3 (a) I $30x + 60y \leq 1800 \Rightarrow x + 2y \leq 60$

x	0	60
y	30	0

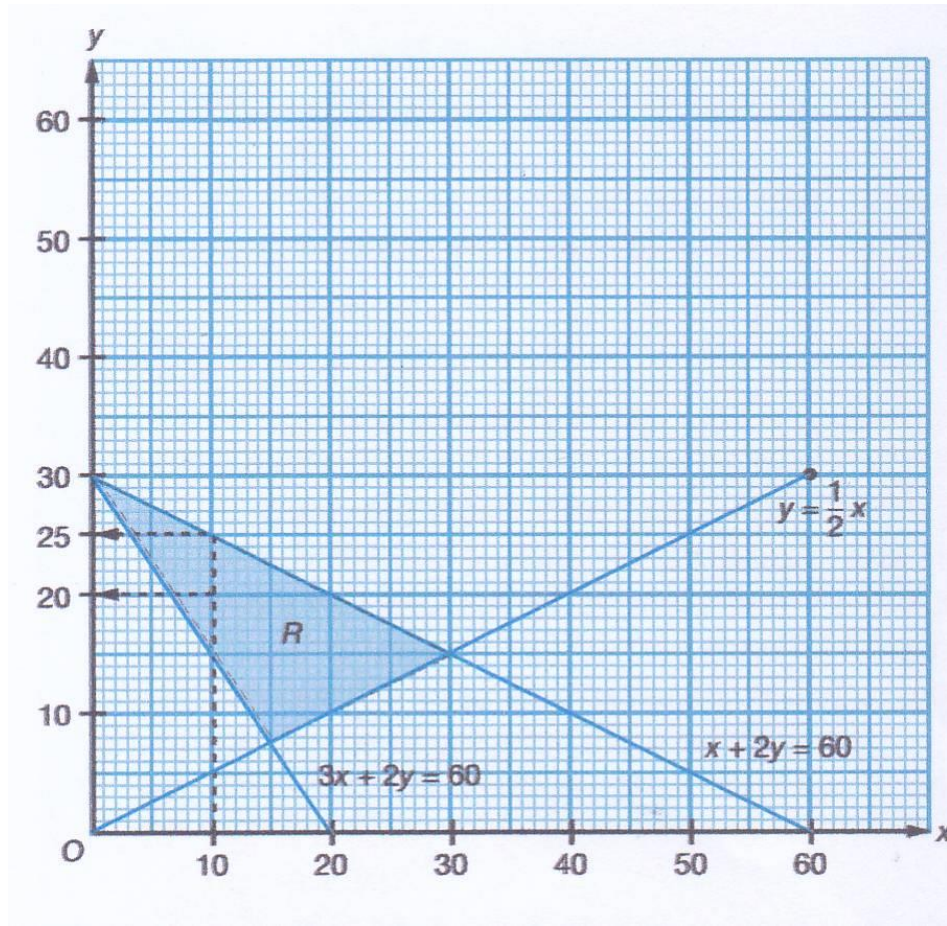
II $3x + 2y \geq 60$

x	0	20
y	30	0

III $x \leq 2y \Rightarrow y \geq \frac{1}{2}x$

x	0	60
y	0	30

(b)



- (c) If 10 batik cloths are produced, draw the straight line $x = 10$.
From the graph, the minimum and maximum numbers of the *songket* cloths that are produced are 20 and 25 respectively.