Praktis Formatif 7.1

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

(b) $y - x \leq 10$

(c) $y \geq \dfrac{1}{10}x$

2 (a) $x \geq 10$

(b) $y \geq 2x$
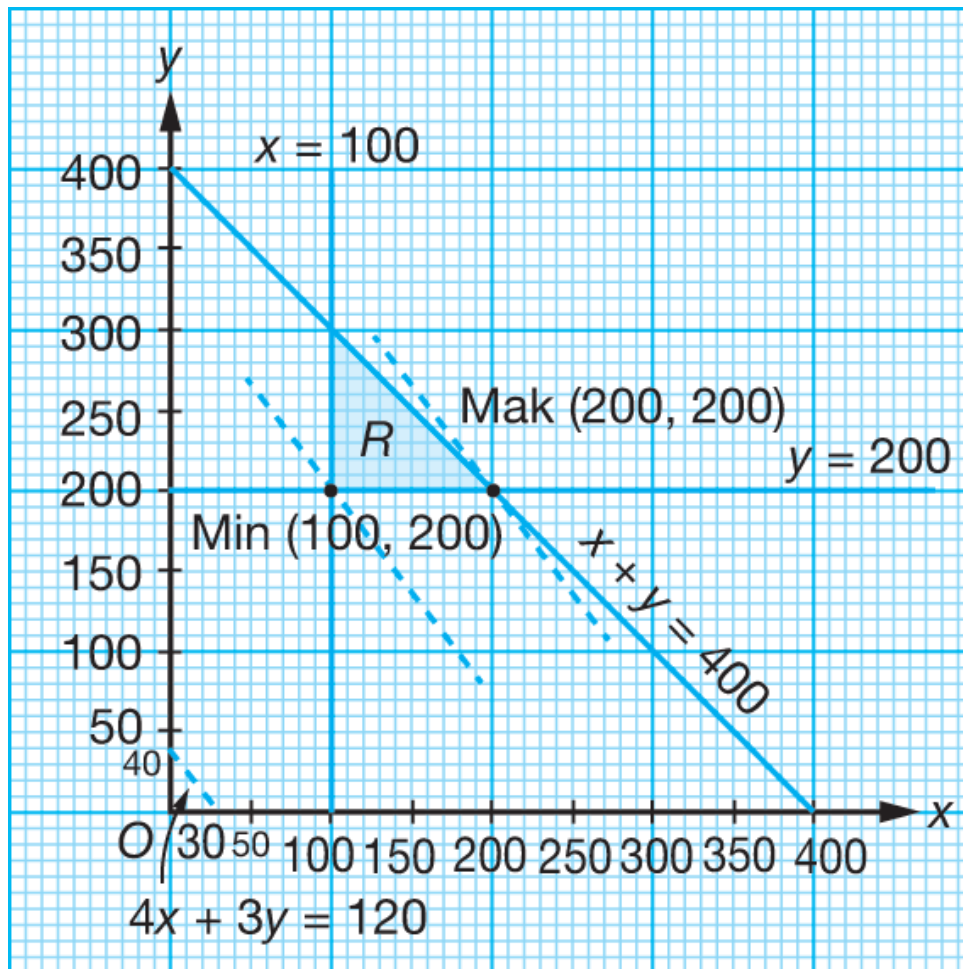
(c) $8x + 12y \leq 12 \times 60 \Rightarrow 2x + 3y \leq 180$

3 (a) $x + y \leq 90$

(b) $x \leq 2y$

(c) $y - x \leq 10$

1 (a) $x \geq 100$, $y \geq 200$, $x + y \leq 400$

(b)

(c) Komisyen $= 4x + 3y$

Lukis garis lurus $4x + 3y = 120$
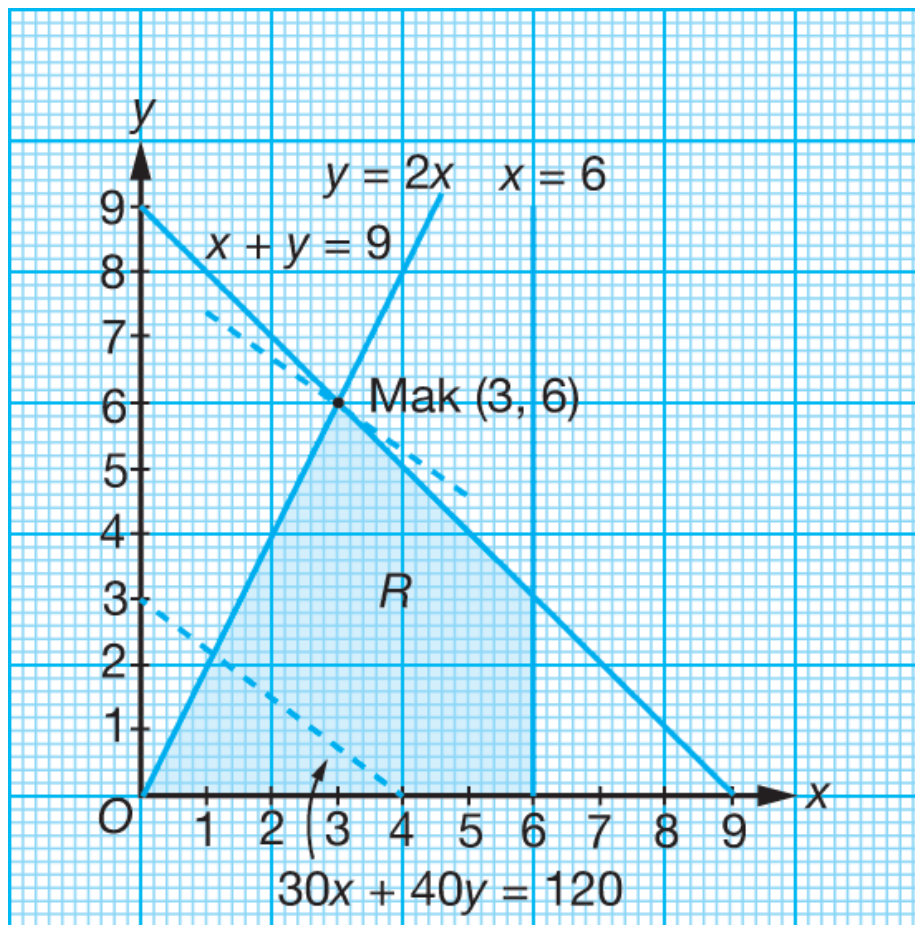
Titik optimum (minimum) ialah $(100, 200)$.
Komisyen minimum $= 4(100) + 3(200) = $ RM1 000

Titik optimum (maksimum) ialah $(200, 200)$.
Komisyen maksimum $= 4(200) + 3(200) = $ RM1 400

2 (a) $x \le 6$, $x + y \le 9$, $y \le 2x$
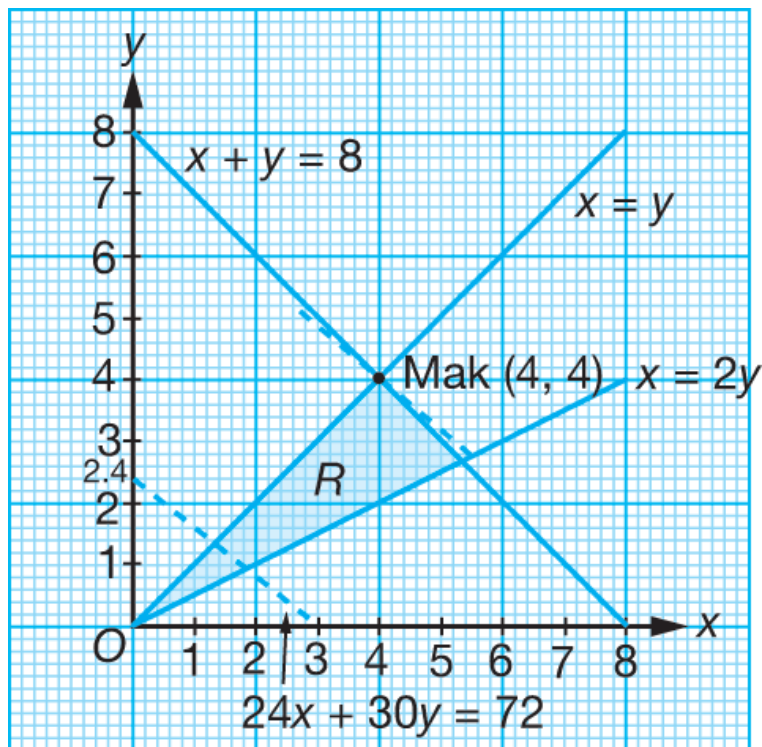
(b)

(c) Yuran bulanan $= 30x + 40y$

Lukis garis lurus $30x + 40y = 120$

Titik optimum ialah (3, 6).

Yuran maksimum $= 30(3) + 40(6) = RM330$

3 (a) $x + y \leq 8$, $x \geq y$, $x \leq 2y$

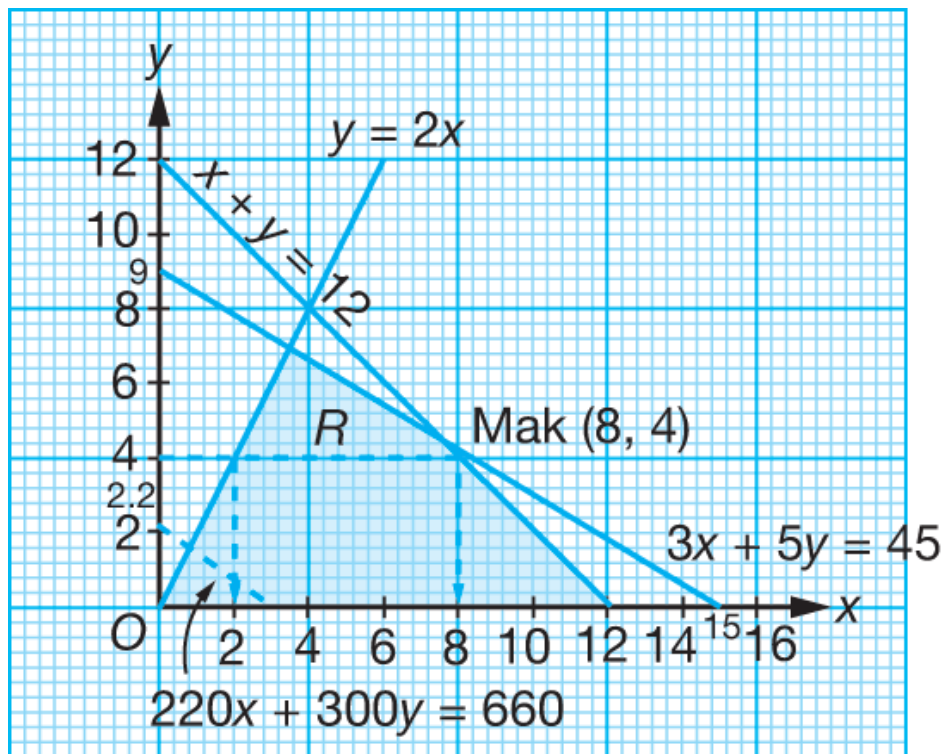(b)

(c) Upah $= 24x + 30y$

Lukis garis lurus $24x + 30y = 72$

Titik optimum ialah (4, 4).

Upah maksimum $= 24(4) + 30(4) = \text{RM}216$

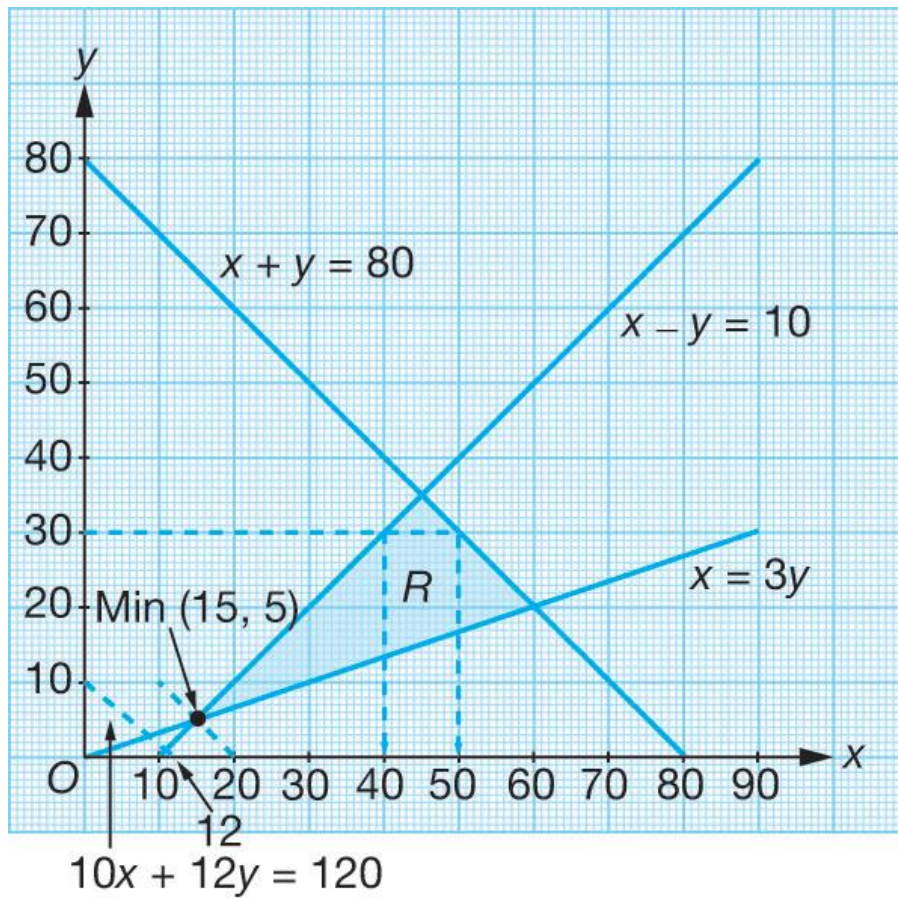**4** (a) $x + y \leq 12$, $y \leq 2x$, $3x + 5y \leq 45$

(b)

(c) (i) Apabila $y = 4$,
   x (minimum) = 2 buah
   x (maksimum) = 8 buah

(ii) Keuntungan = $220x + 300y$
   Lukis garis lurus $220x + 300y = 660$
   Titik optimum ialah $(8, 4)$.

   Keuntungan maksimum = $220(8) + 300(4) = RM2\ 960$

5 (a) $x + y \leq 80$, $x \leq 3y$, $x - y \geq 10$

(b)

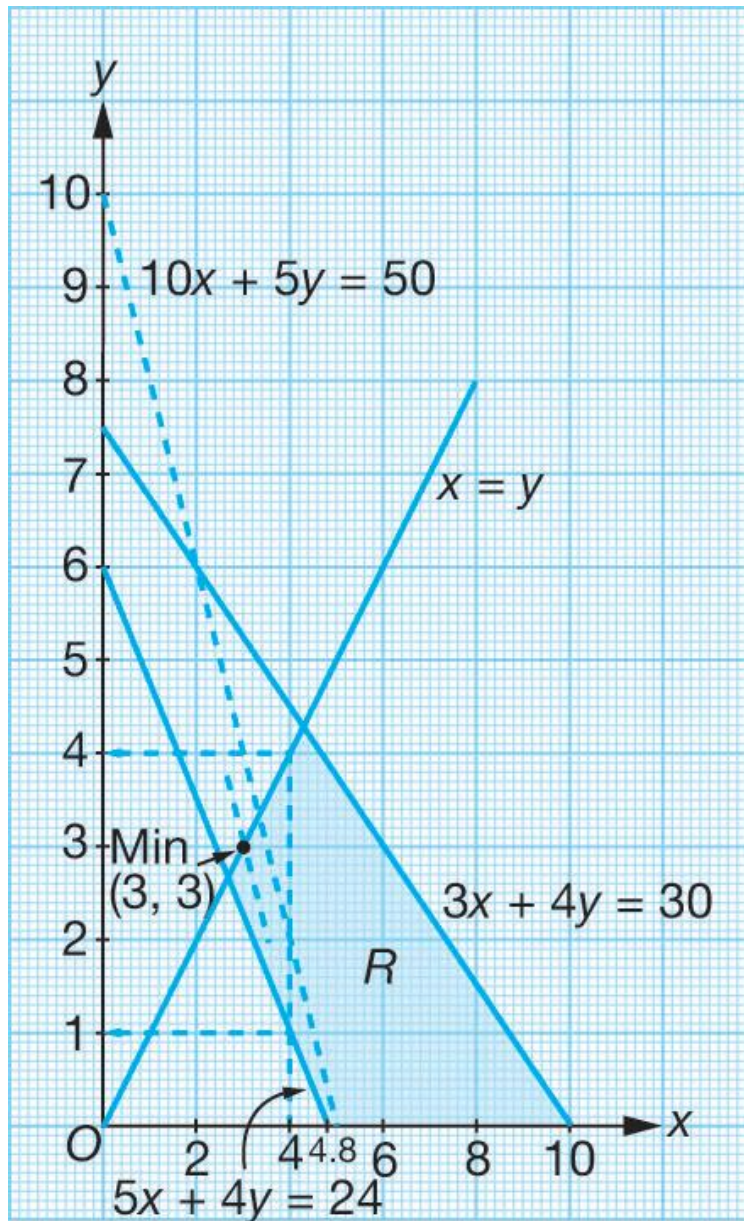(c) (i) Apabila $y = 30$, $40 \leq x \leq 50$.

(ii) Kos $= 10x + 12y$

Lukis garis lurus $10x + 12y = 120$

Titik optimum (minimum) ialah (15, 5).

Kos minimum $= 10(15) + 12(5) = $ RM210

6 (a) $60x + 80y \le 10 \times 60 \Rightarrow 3x + 4y \le 30,$

$75x + 60y \ge 6 \times 60 \Rightarrow 5x + 4y \le 24,$

$x \ge y$

(b)

(c) (i) Upah $= 10x + 5y$

Lukis garis lurus $5x + 4y = 24$

Titik optimum (minimum) ialah (3, 3).

Upah minimum $= 10x + 5y = 10(3) + 5(3) = $ RM45
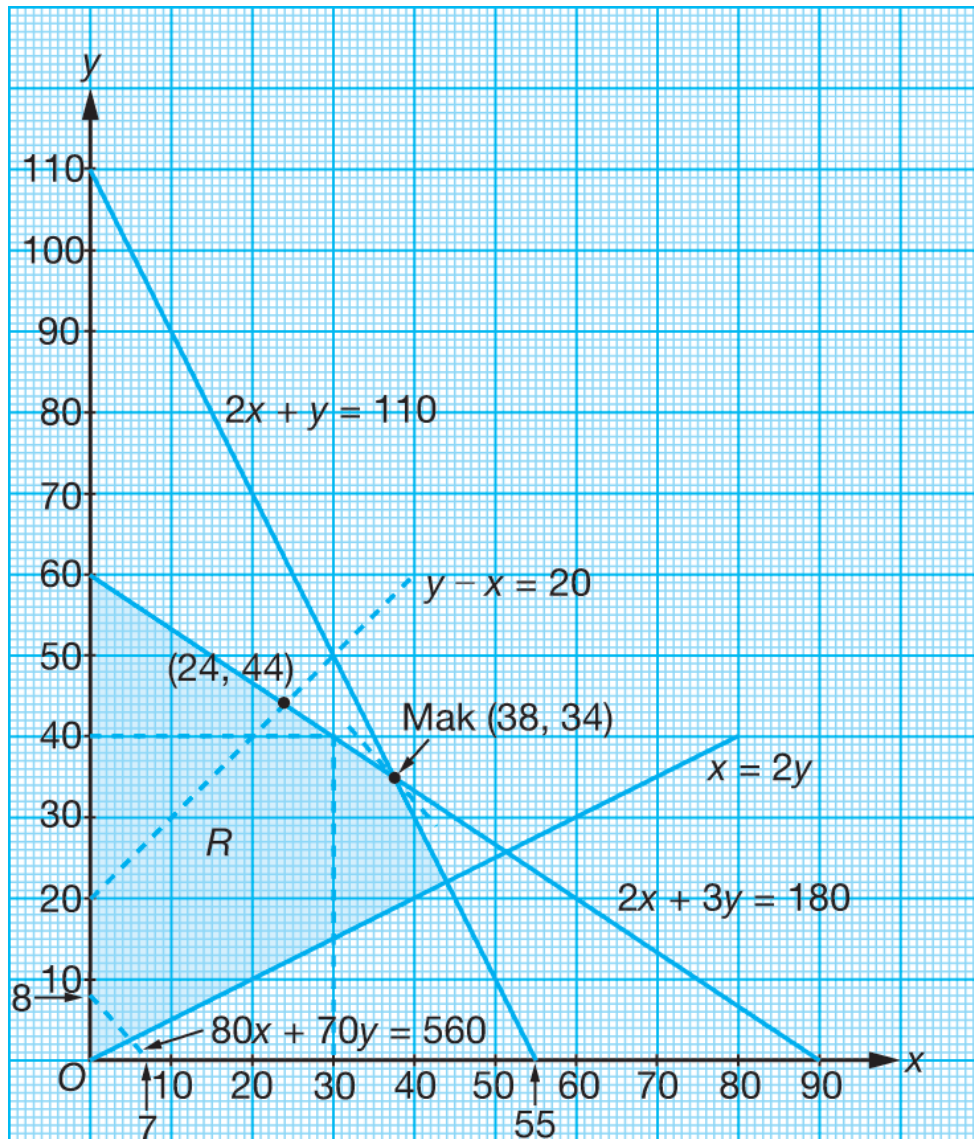
(ii) Apabila $x = 4$, y (mimimum) $= 1$
Upah minimum $= 10(4) + 5(1) = $ RM45

Apabila $x = 4$, y (maksimum) $= 4$
Upah maksimum $= 10(4) + 5(4) = $ RM60

7 (a) $80x + 120y \le 7\ 200 \Rightarrow 2x + 3y \le 180,$
$60x + 30y \le 3\ 300 \Rightarrow 2x + y \le 110,$
$x \le 2y$

(b)

(c) (i) Keuntungan $= 80x + 70y$
Lukis garis lurus $80x + 70y = 560$
Titik optimum ialah (38, 34).

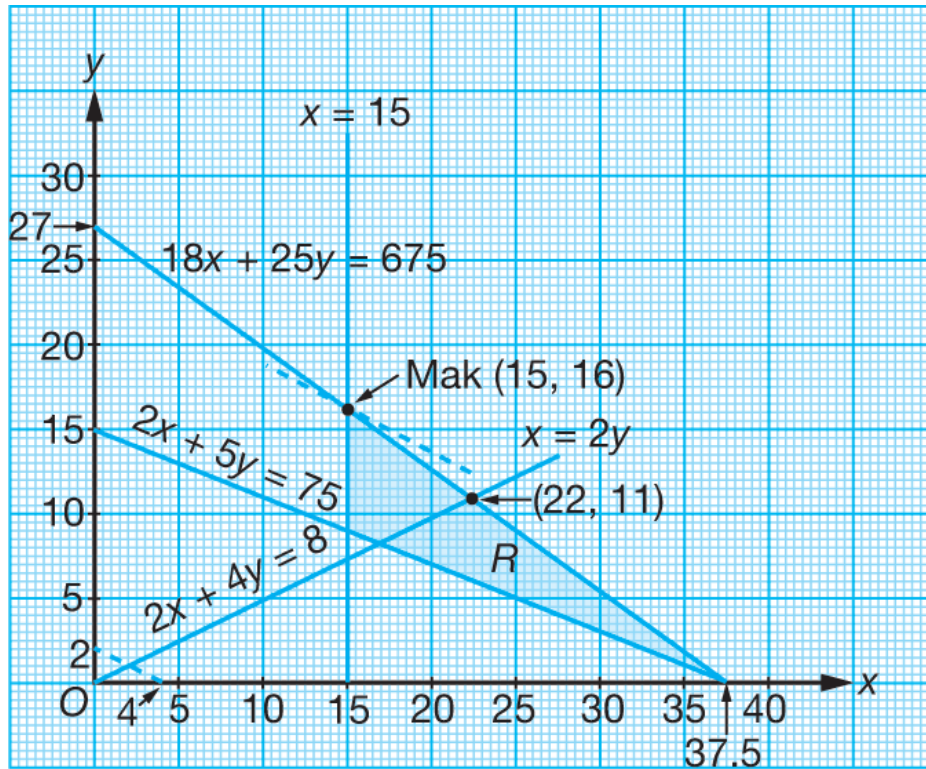Keuntungan maksimum $= 80(38) + 70(34) = 5\ 420$ sen $=$ RM54.20

(ii) Lukis garis lurus $y - x = 20$
x (maksimum) $= 24$ biji kek
y (maksimum) $= 44$ biji ban

8 (a) $180x + 250y \le 6\,750 \Rightarrow 18x + 25y \le 675,$

$60\,000x + 150\,000 \le 2\,250\,000 \Rightarrow 2x + 5y \le 75,$
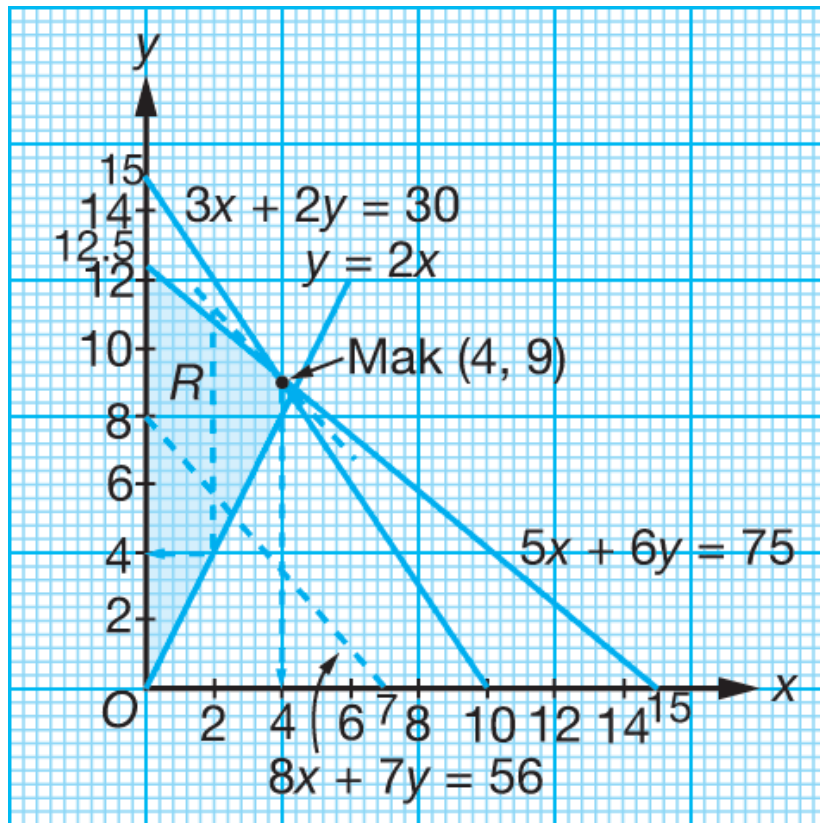
$x \ge 15$

(b)

(c) (i) Keuntungan $= 20\,000x + 40\,000y$

Lukis garis lurus $20\,000x + 40\,000y = 80\,000$

$$2x + 4y = 8$$

Titik optimum ialah $(15, 16)$.

Keuntungan maksimum $= 20\,000(15) + 40\,000(16) = \text{RM}940\,000$

(ii) Lukis garis lurus $x = 2y$.

x (maksimum) $= 22$ buah,

y (maksimum) $= 11$ buah

9 (a) $50x + 60y \leq 750 \Rightarrow 5x + 6y \leq 75,$

$60x + 40y \leq 10 \times 60 \Rightarrow 3x + 2y \leq 30,$

$y \geq 2x$

(b)

(c) (i) Keuntungan = $8x + 7y$

Lukis garis lurus $8x + 7y = 56$

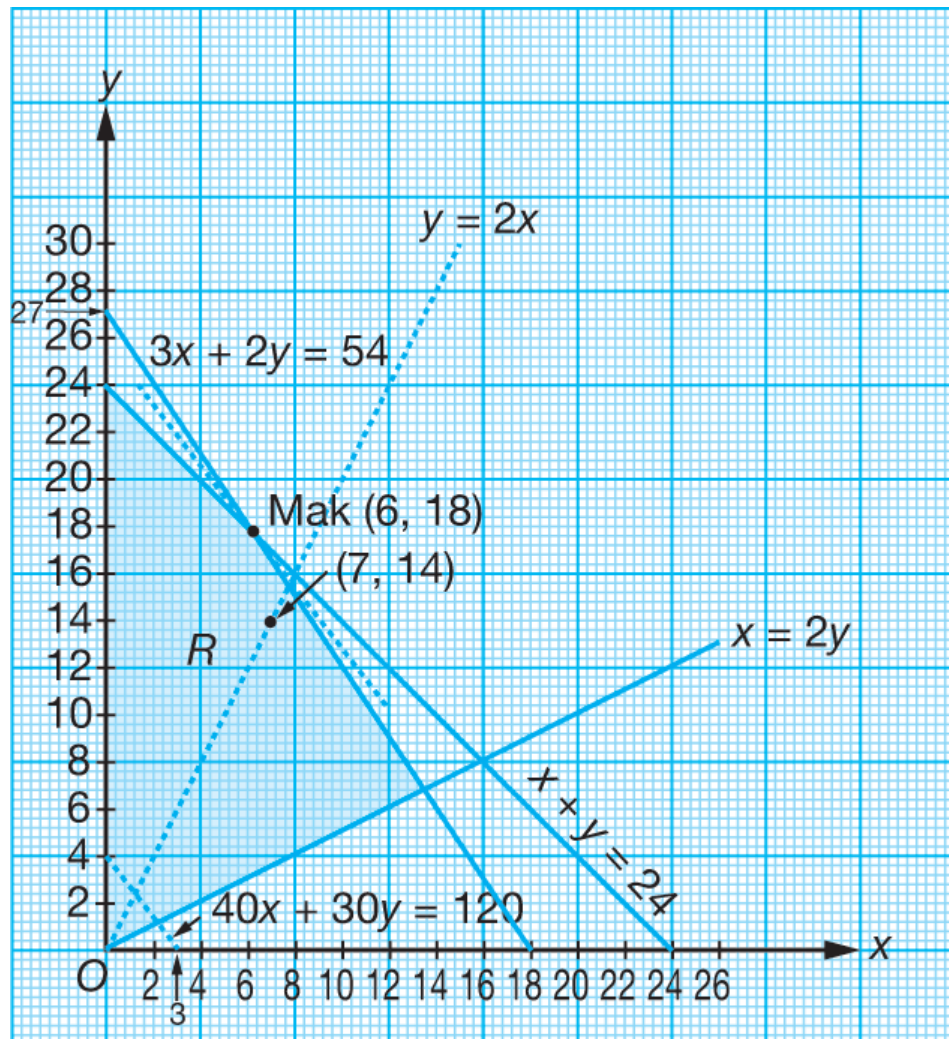Titik optimum ialah (4, 9).

Keuntungan maksimum = $8(4) + 7(9) = RM95$

(ii) x (maksimum) = 4 buah bakul

(iii) Apabila $x = 2$, y (minimum) = 4 alas lantai

1   (a) $6x + 4y \le 108 \Rightarrow 3x + 2y \le 54,$
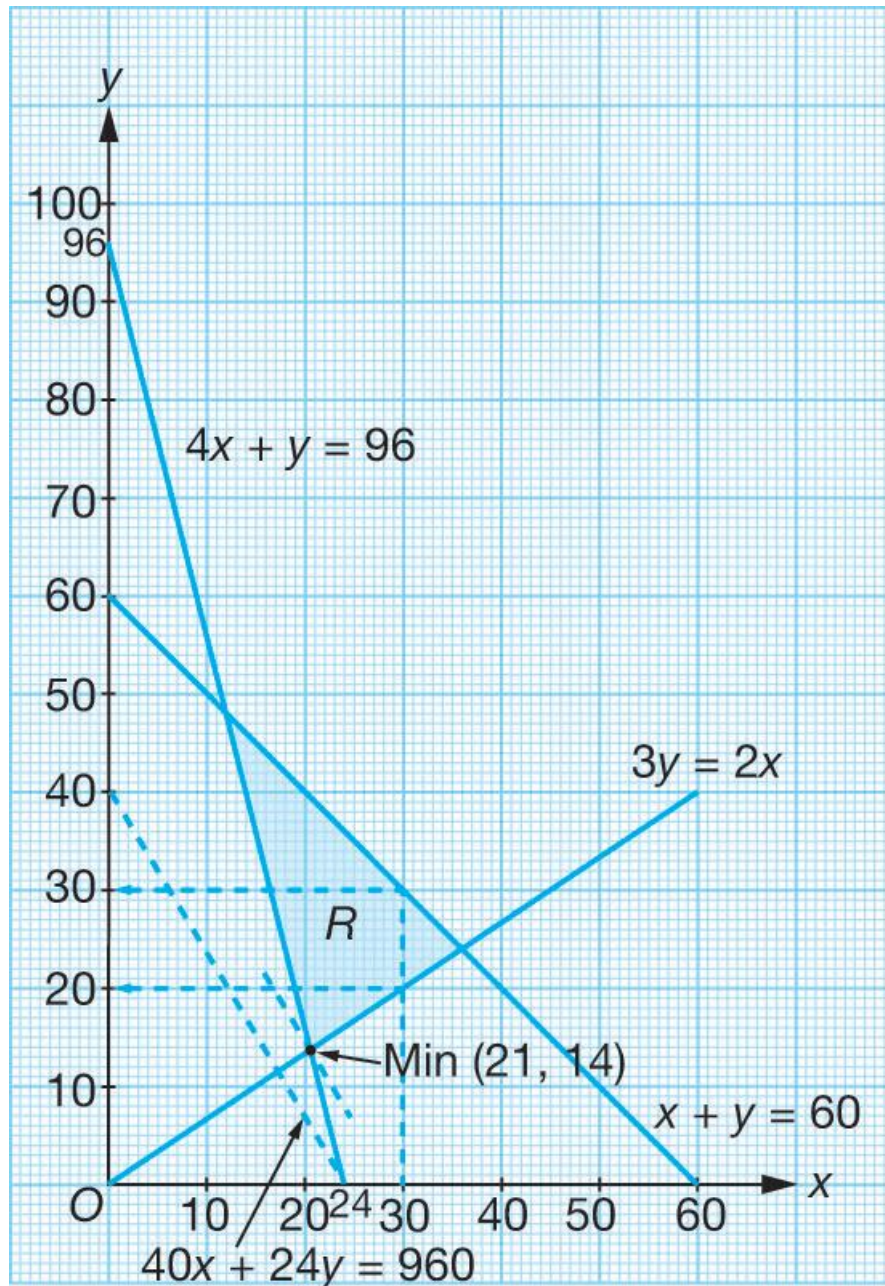
$x + y \le 24, \ y \ge x$

(b)

(c) (i) Keuntungan $= 40x + 30y$

Lukis garis lurus $40x + 30y = 120$

Titik optimum ialah (6, 18).

Keuntungan maksimum $= 40(6) + 30(18) = $ RM780

   (ii) Lukis garis lurus $y = 2x$

x (maksimum) = 7 batang raket,
y (maksimum) = 14 batang raket

2 (a) $2x + 2y \le 120 \Rightarrow x + y \le 60$,

$4x + y \ge 96$

$x \le \dfrac{60}{100}(x+y) \Rightarrow x \le \dfrac{3}{5}(x+y) \Rightarrow 5x \le 3x + 3y \Rightarrow 3y \ge 2x$

(b)

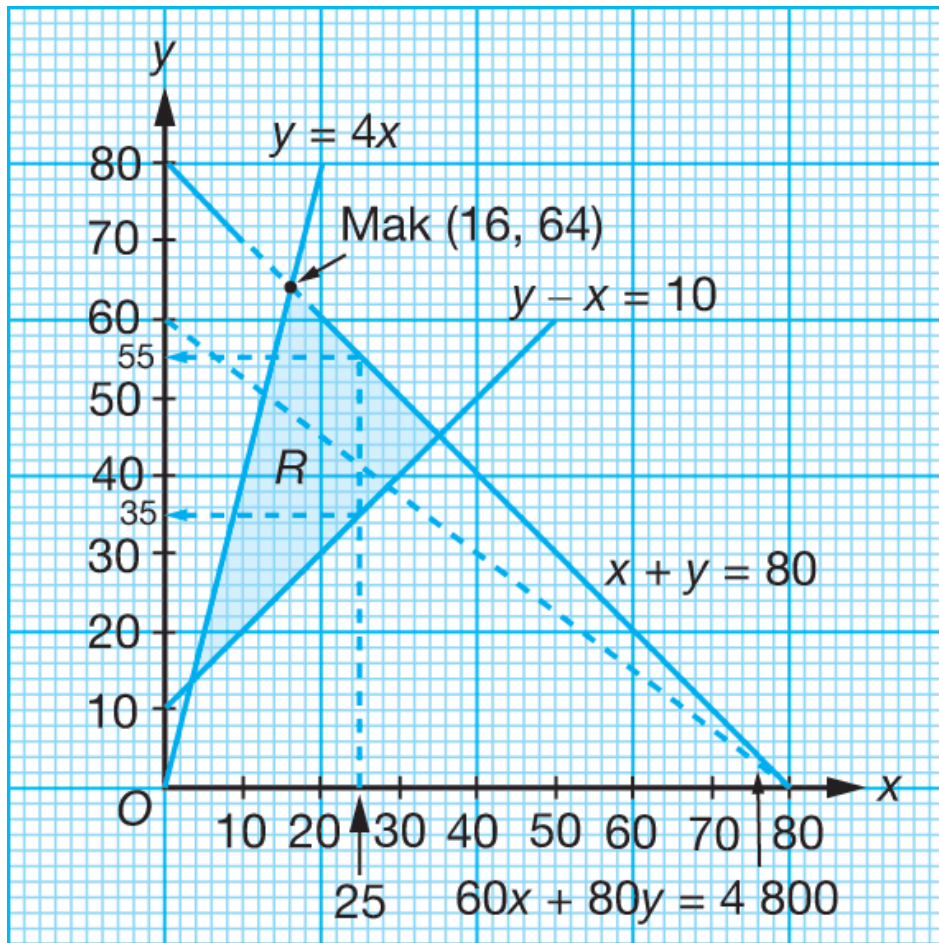(c) (i) Kos $= 40x + 24y$

Lukis garis lurus $40x + 24y = 960$

Titik optimum (minimum) ialah (21, 14)

Kos minimum $= 40(21) + 24(14) = $ RM1 176

(ii) Apabila $x = 30$, $20 \le y \le 30$

3 (a) $x + y \le 80$, $y \le 4x$, $y - x \ge 10$
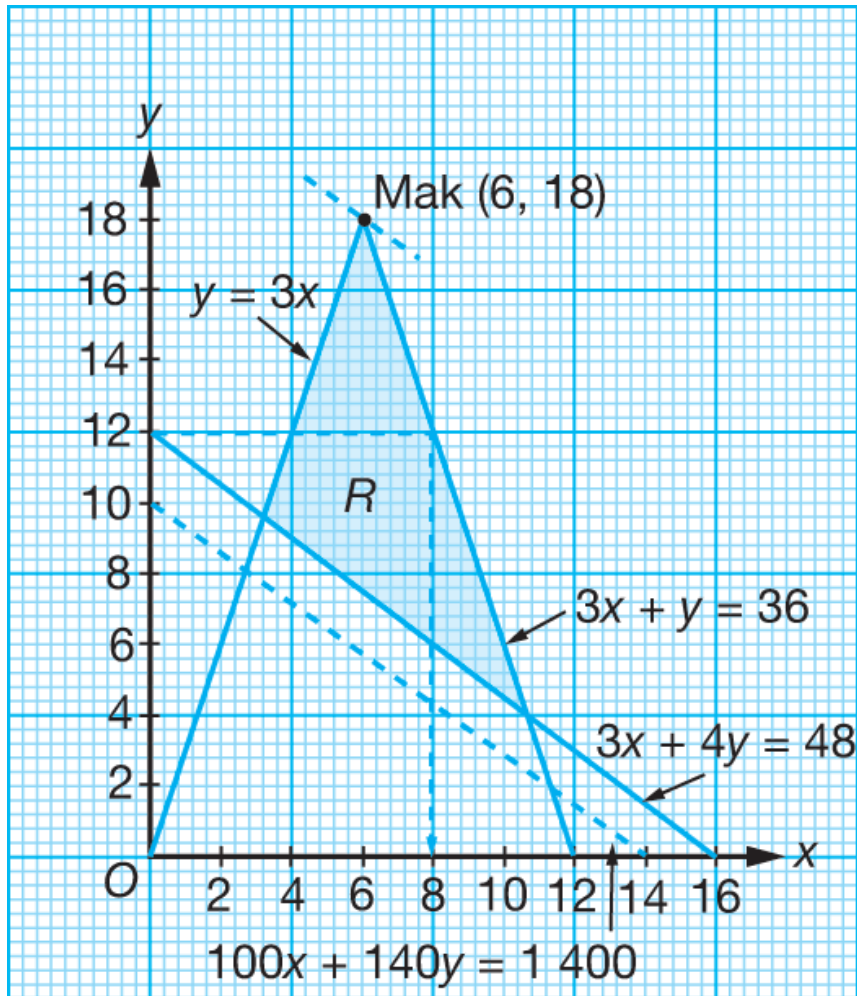
(b)

(c) (i) Apabila $x = 25$, $35 \le y \le 55$

(ii) Peruntukan $= 60x + 80y$

Lukis garis lurus $60x + 80y = 4\,800$

Titik optimum ialah (16, 64).

Peruntukan maksimum $= 60x + 80y = 60(16) + 80(64) = \text{RM6 080}$

4 (a) $60x + 20y \le 12 \times 60 \Rightarrow 3x + y \le 36,$

$30x + 40y \ge 8 \times 60 \Rightarrow 3x + 4y \ge 48,$
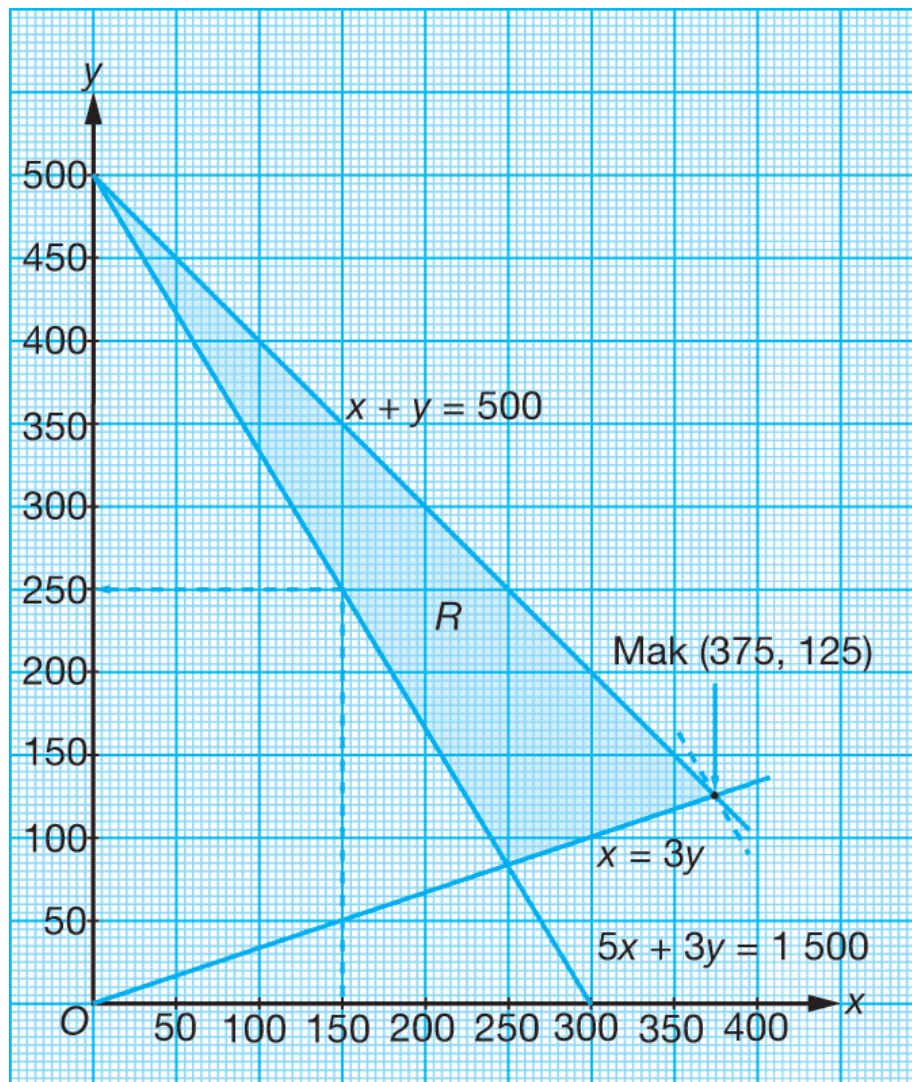
$y \le 3x$

(b)

(c) (i) Apabila $y = 12$, x (maksimum) = 8 buah piala

(ii) Keuntungan = $100x + 140y$
Lukis garis lurus $100x + 140y = 1\ 400$
Titik optimum ialah (6, 18).

Keuntungan maksimum = $100(6) + 140(18)$ = RM3 120

5 (a) $x + y \leq 500$, $x \leq 3y$, $5x + 3y \geq 1\,500$

(b)

(c) (i) Jika $x = 150$, y (minimum) $= 250$ kotak fail poket
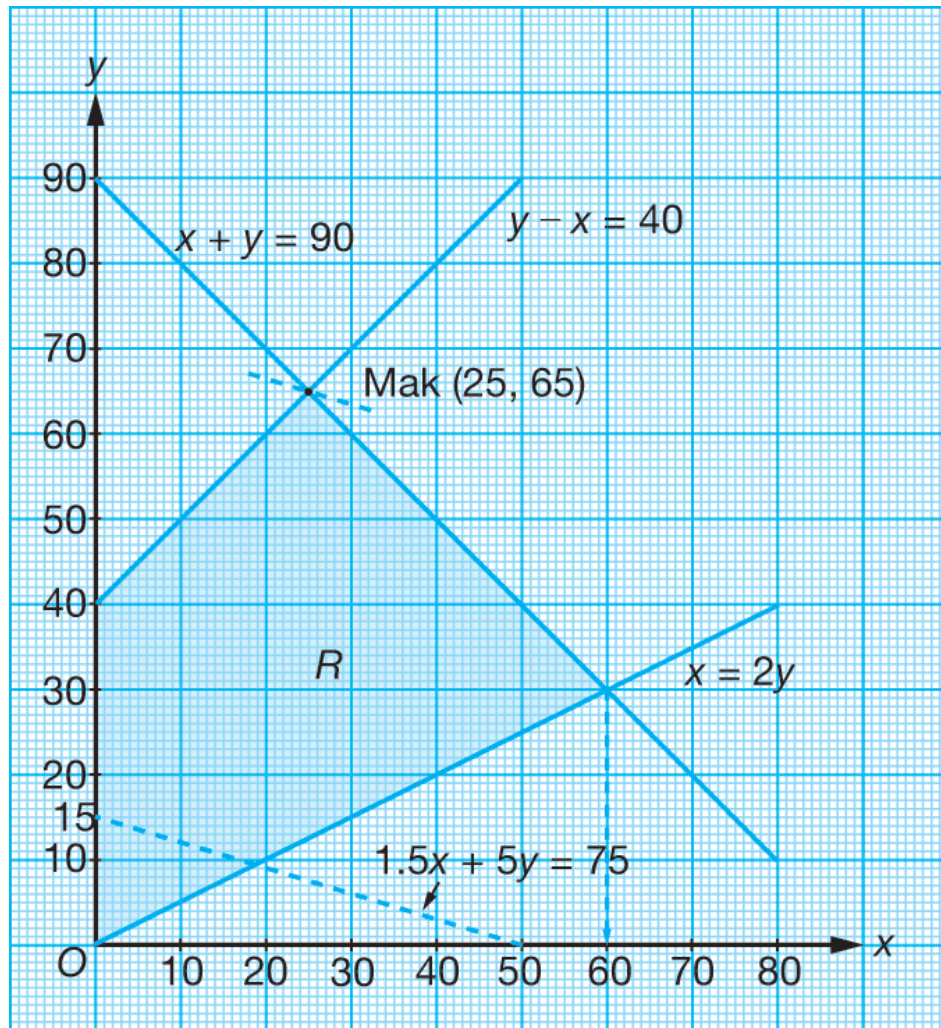
(ii) Keuntungan $= 5x + 3y$
Lukis garis lurus $5x + 3y = 1\,500$
Titik optimum ialah (375, 125)
Keuntungan maksimum $= 5(375) + 3(125) = $ RM2 250

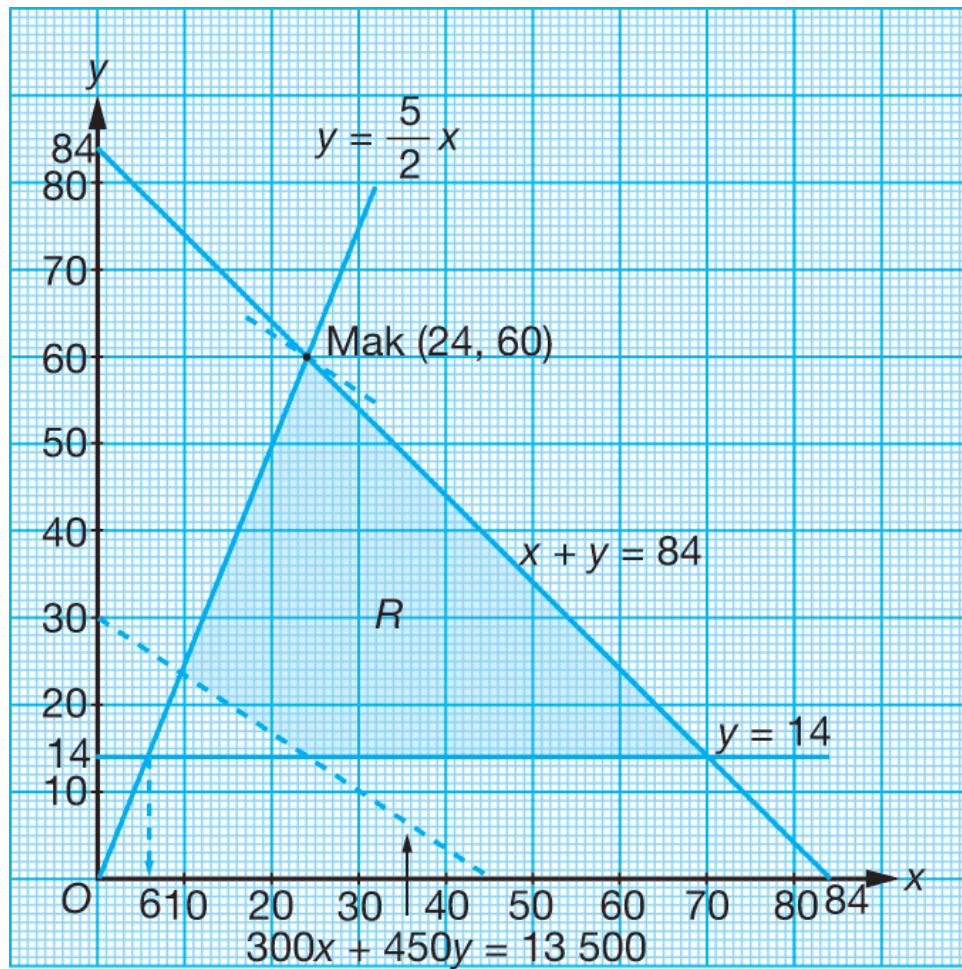**6** (a) $x + y \leq 90$, $x \leq 2y$, $y - x \leq 40$

(b)

(c) (i) x (maksimum) = 60 batang pen

(ii) Kos = $1.5x + 5y$
Lukis garis lurus $1.5x + 5y = 75$
Titik optimum ialah (25, 65).

Kos maksimum = $1.5(25) + 5(65)$ = RM362.50

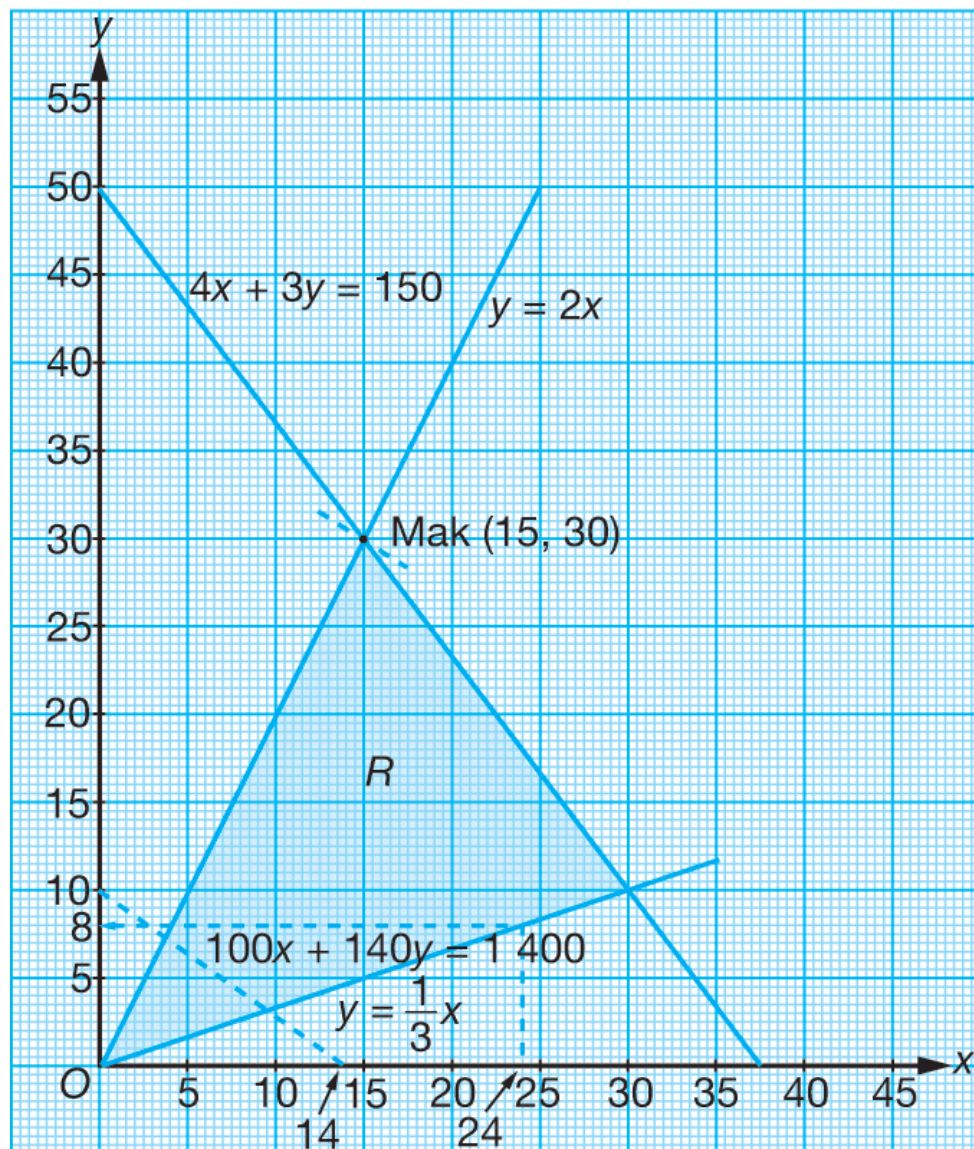**7** (a) $x + y \le 84$, $y \ge 14$, $y \le \dfrac{5}{2}x$

(b)

(c) (i) x (minimum) $= 6$ orang peserta

(ii) Yuran $= 300x + 450y$
Lukis garis lurus $300x + 450y = 13\,500$
Titik optimum ialah $(24, 60)$.

Yuran maksimum $= 300(24) + 450(60) = $ RM34 200

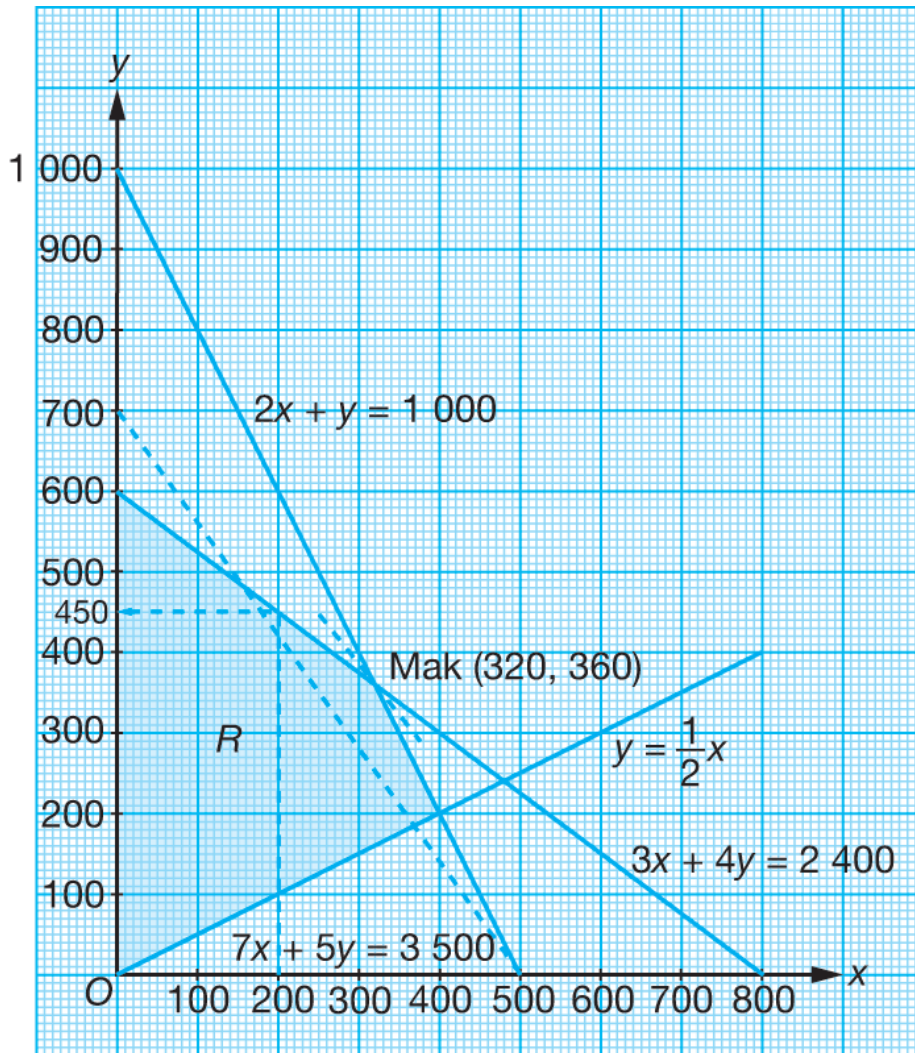**8** (a) $y \le 2x$, $y \ge \frac{1}{3}x$, $4x + 3y \le 150$

(b)

(c) (i) Jika $x = 24$, y (minimum) = 8 tin cat

(ii) Perbelanjaan = $100x + 140y$

Lukis garis lurus $100x + 140y = 1\ 400$

Titik optimum ialah $(15, 30)$.

Perbelanjaan maksimum = $100(15) + 140(30) = $ RM5 700

9 (a) $3x + 4y \le 2\,400$, $2x + y \le 1\,000$, $y \ge \dfrac{1}{2}x$

(b)

(c) (i) Jika $x = 200$, y (maksimum) = 450 buah kerusi
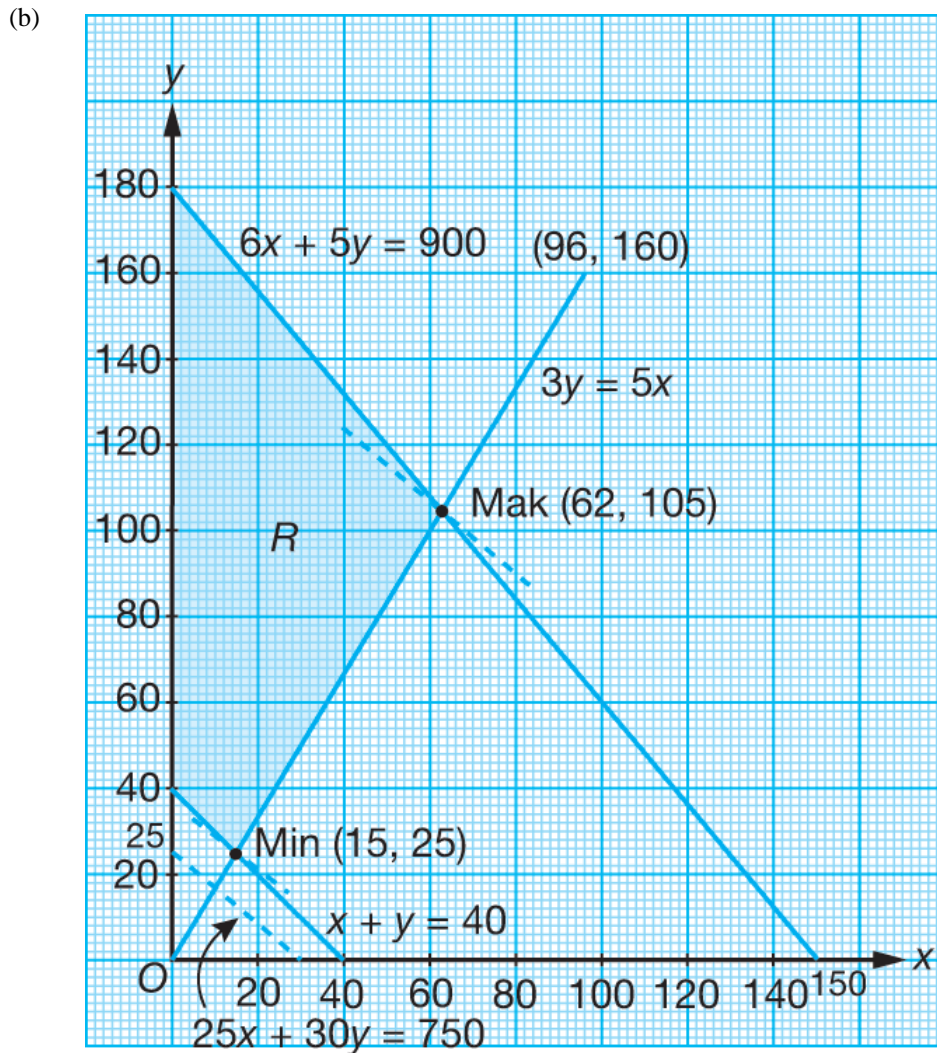 (ii) Keuntungan = $7x + 5y$
    Lukis garis lurus $7x + 5y = 3\,500$
    Titik optimum ialah (320, 360).

    Keuntungan maksimum = $7(320) + 5(360)$ = RM4 040

10 (a) $x + y \geq 40$,

$96x + 80y \leq 240 \times 60 \Rightarrow 6x + 5y \leq 900$,

$\dfrac{x}{y} \leq \dfrac{3}{5} \Rightarrow 3y \geq 5x$

(b)

(c) Jumlah jualan = $25x + 30y$
Lukis garis lurus $25x + 30y = 750$

Titik optimum (minimum) ialah (15, 25).
Jumlah jualan minimum = 25(15) + 30(25) = RM1 150

Titik optimum (maksimum) ialah (62, 105).
Jumlah jualan maksimum = 25(62) + 30(105) = RM4 700

Maka, RM1 125 $\leq$ Jumlah jualan $\leq$ RM4 700