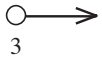
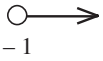
# Text *F6 Solving Inequalities* Answers

## F6.1 Inequalties on a Number Line

1. (a) 

(b) 

(c) 

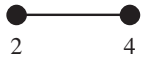
(d) 

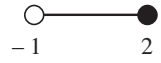

(e) 

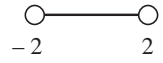
(f) 

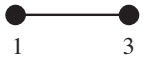
(g) 

(h) 


(i) 

(j) 

(k) 

(l) 

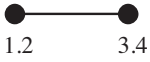

2 (a) $x < 1$ (b) $x \geq -2$ (c) $x \geq -1$ (d) $-2 \leq x \leq 2$

(e) $x > -3$ (f) $-2 < x \leq 2$ (g) $-1 < x < 3$ (h) $-1 < x \leq 3$

(i) $-4 \leq x < 1$ (j) $-5 \leq x < 10$

3. (a) 

(b) $30 \leq V \leq 70$

4. (a) 

(b) $1.2 \leq x \leq 3.4$

5. (a) $1, 2, 3, 4, 5, 6, 7, 8$ (b) $4, 5, 6$ (c) $2, 3, 4$ (d) $4, 5$

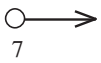
6. (a) $-1, 0, 1$ (b) $-5, -4, -3, -2$ (c) $-1, 0$ (d) $-4, -3$

7. (a) $\frac{3}{4}$, etc (b) $\frac{1}{3}$, etc (c) $\frac{5}{12}$, etc (d) $\frac{1}{4}$, etc

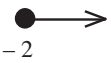
8. $-3, -2, -1, 0, 1$

## F6.2 Solution of Linear Inequalities

1. (a) $x \leq 3$

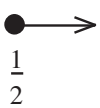

(b) $x > 7$


(c) $x < 5$


(d) $x \geq -2$



(e) $x < 5$



(f) $x \geq \frac{1}{2}$



2. (a) $x < 7$ (b) $x \geq -3$ (c) $x \leq 4$ (d) $x \geq \frac{2}{3}$

(e) $x < \frac{4}{5}$ (f) $x > \frac{6}{7}$ (g) $x \leq 6$ (h) $x > 2$

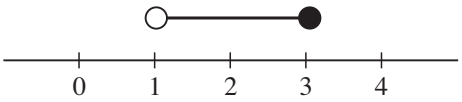
(i) $x \leq 4$ (j) $x \geq 3$ (k) $x < 3\frac{1}{5}$ (l) $x \geq 3\frac{1}{3}$

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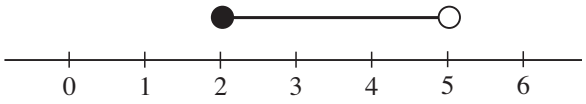
# Text *F6 Solving Inequalities* Answers

## F6.2

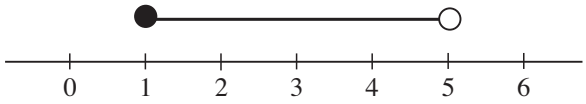
3. (a) $1 < x \leq 3$



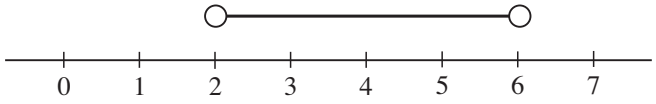

(b) $2 \leq x < 5$



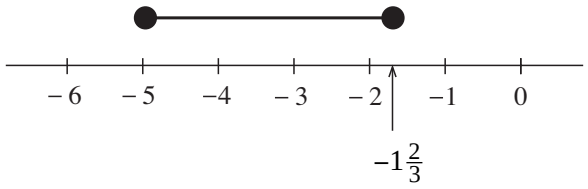

(c) $1 \leq x < 5$



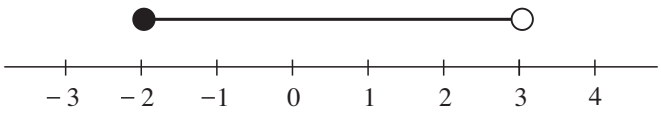

(d) $2 < x < 6$




(e) $-5 \leq x \leq -1\frac{2}{3}$




(f) $-2 \leq x < 3$




4. (a) $-1 < x \leq \frac{4}{5}$ (b) $2 \leq x < \frac{9}{2}$ (c) $\frac{1}{3} < x < \frac{2}{3}$

(d) $\frac{1}{2} \leq x \leq \frac{15}{8}$ (e) $-1 \leq x \leq -\frac{3}{4}$ (f) $1 < x < 6$

5. (b) $50 \leq 4x - 20 \leq 120$ (c) $18 \leq x \leq 35$ (rounded to 18 as you cannot have 17.5 haircuts)

6. (a) $200 \leq m \leq 320$ (b) $200 \leq \frac{5k}{8} \leq 320$ (c) $320 \leq k \leq 512$

7. (a) $50 \leq C \leq 90$ (b) $C = 0.1n + 10$ (c) $400 \leq n \leq 800$

8. $15\frac{5}{9} \leq C \leq 21\frac{1}{9}$

9. (a) $-1, 0, 1, 2$ and $3$ (b) $17, 18, 19, 20$ or $21$

10. (a) (i) $-4, -3, -2, -1, 0$ and $1$ (ii) $16$ (b) $10 \leq x < 20$

## F6.3 Inequalities Involving Quadratic Terms

1. (a) $-1 \leq x \leq 1$ (b) $x \geq 2$ or $x \leq -2$ (c) $x \geq 5$ or $x \leq -5$

(d) $-7 < x < 7$ (e) $x > 6$ or $x < -6$ (f) $x > 2$ or $x < -2$

(g) $x \geq 2.5$ or $x \leq -2.5$ (h) $-0.5 < x < 0.5$ (i) $x \geq 1.5$ or $x \leq -1.5$

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# Text *F6 Solving Inequalities* Answers

## F6.3

2. (a) $x \geq 4$ or $x \leq -4$ (b) $x \geq 2$ or $x \leq -2$ (c) $-5 < x < 5$

   (d) $-\frac{1}{2} < x < \frac{1}{2}$ (e) $x \geq \frac{2}{3}$ or $x \leq -\frac{2}{3}$ (f) $x \geq \frac{2}{5}$ or $x \leq -\frac{2}{5}$

   (g) $-\frac{1}{3} \leq x \leq \frac{1}{3}$ (h) $-3 < x < 3$ (i) $x \geq 10$ or $x \leq -10$

   (j) $-2 < x < 2$ (k) $x \geq 3$ or $x \leq -3$ (l) $-\frac{1}{2} \leq x \leq \frac{1}{2}$

3. (a) $x \geq 2$ or $x \leq -3$ (b) $2 \leq x \leq 5$ (c) $x > 5$ or $x < 0$

   (d) $0 \leq x \leq 6$ (e) $2 < x < 5$ (f) $x > 3$ or $x < -4$

   (g) $x \geq 1$ or $x \leq -\frac{1}{2}$ (h) $-2 \leq x \leq \frac{3}{2}$

4. $9 \leq x^2 \leq 16$ ; $3 \leq x \leq 4$

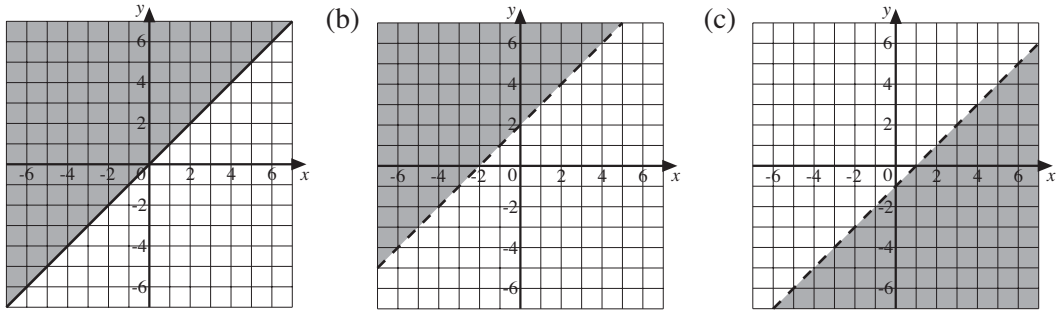
5. (a) $A = 8x^2$ (b) $2 \leq x \leq 5$ (c) 20 (d) 4

6. (a) $x < 2$ (b) $-1 < x < 1$

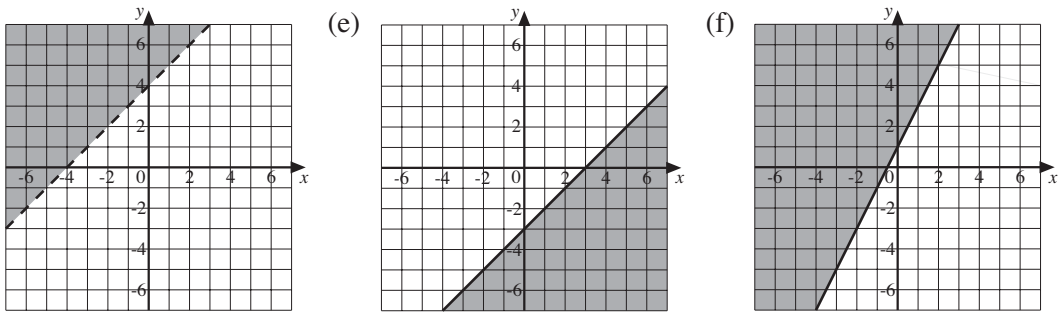
7. (b) $x > \frac{3}{2} + \frac{1}{2}\sqrt{5}$ or $x < \frac{3}{2} - \frac{1}{2}\sqrt{5}$

## F6.4 Graphical Approach to Inequalities

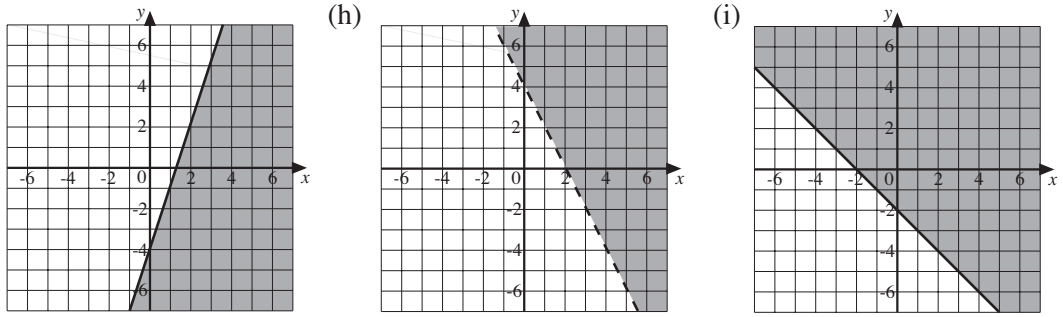
1. (a) (b) (c)




(d) (e) (f)



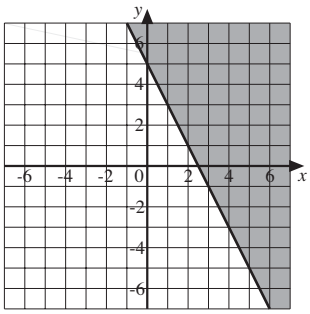

(g) (h) (i)

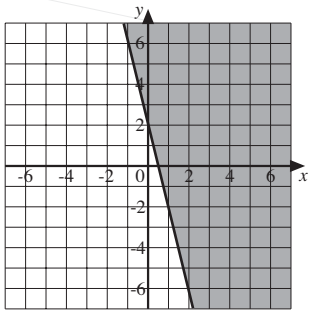


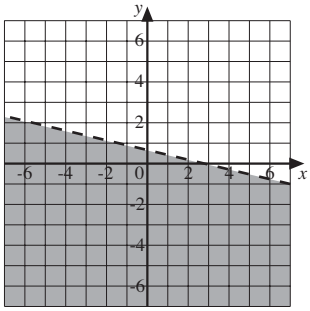

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# Text *F6 Solving Inequalities* Answers

## F6.4

(j) 

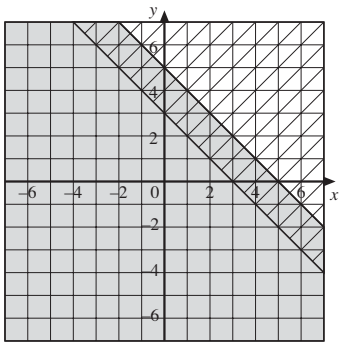
(k) 

(l) 

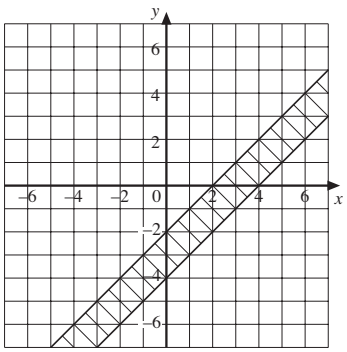
2. (a) (i) $y = x + 1$ (ii) $y \leq x + 1$ (b) (i) $y = 2x$ (ii) $y > 2x$

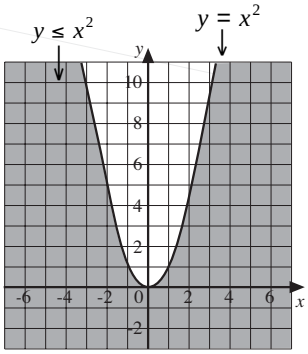
   (c) (i) $x + y = 5$ (ii) $x + y \leq 5$ (d) (i) $x + y = 4$ (ii) $x + y > 4$

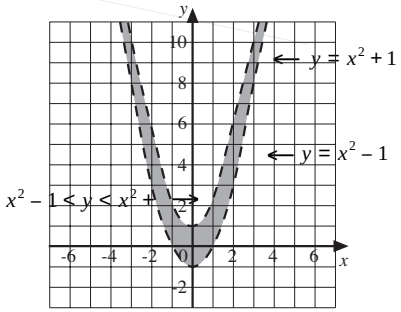
   (e) (i) $y = x + 2$ (ii) $y \geq x + 2$ (f) (i) $y = x - 1$ (ii) $y < x - 1$

3. (a) 

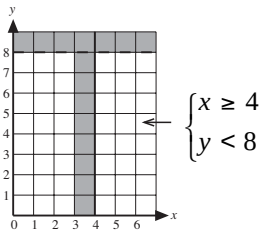
   $3 \leq x + y \leq 5$

   (b) 

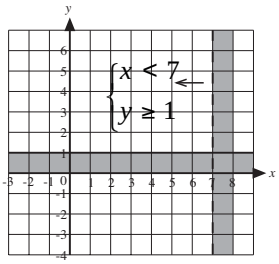
4. (a) 


   (b) 


## F6.5 Dealing With More Than One Inequality

1. (a) 

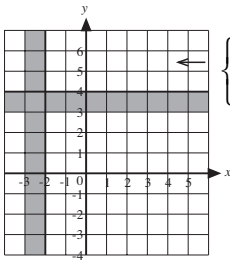
   $\begin{cases} x \geq 4 \\ y < 8 \end{cases}$

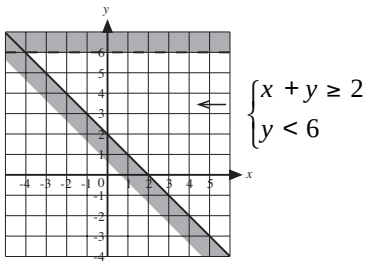
   (b) 

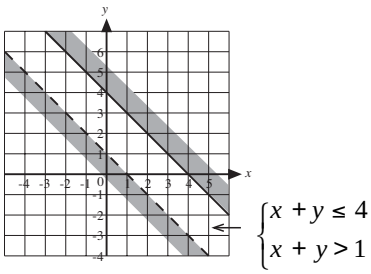
   $\begin{cases} x < 7 \\ y \geq 1 \end{cases}$

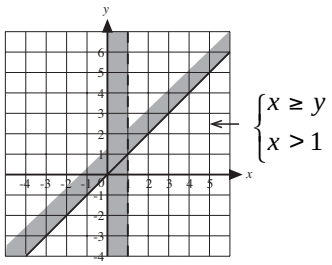
# Text *F6 Solving Inequalities* Answers

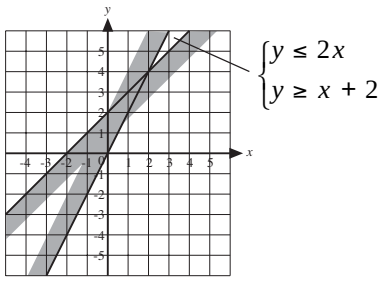
F6.5

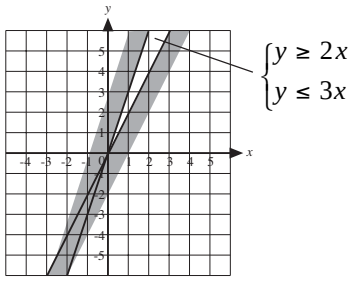
(c) 

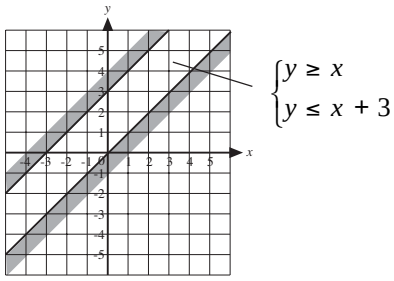

(d) 

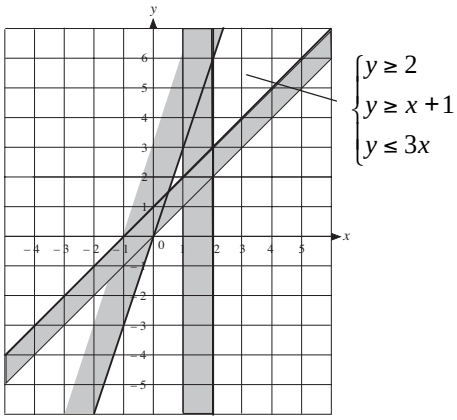

(e) 


(f) 

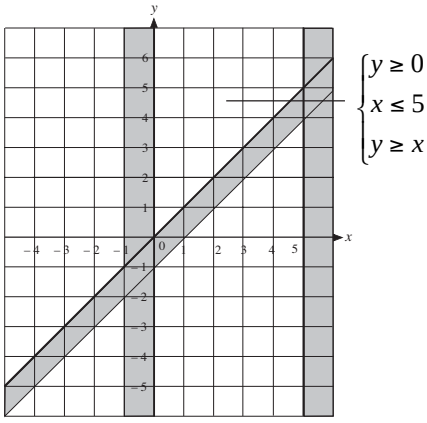

(g) 


(h) 


(i) 


2. (a) 


Vertices: $(2, 3)$, $(2, 6)$

(b) 

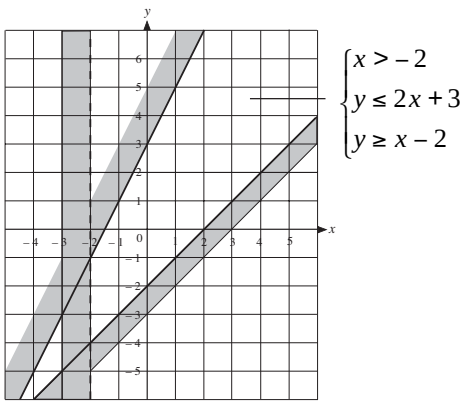

Vertices: $(0, 0)$, $(5, 5)$

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# Text *F6 Solving Inequalities* Answers

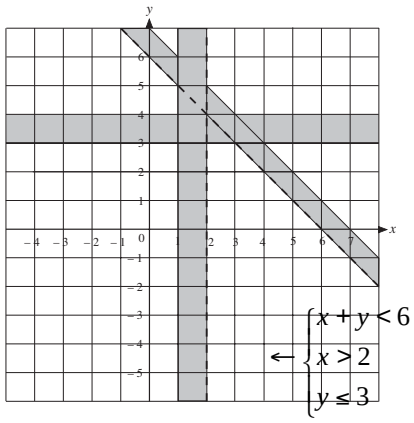
F6.5

(c)



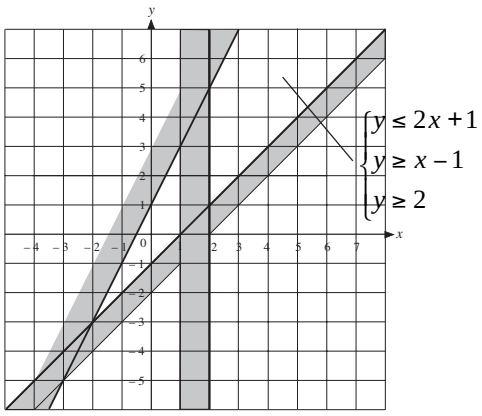

Vertices: $(-2, -4)$, $(-2, -1)$

(d)



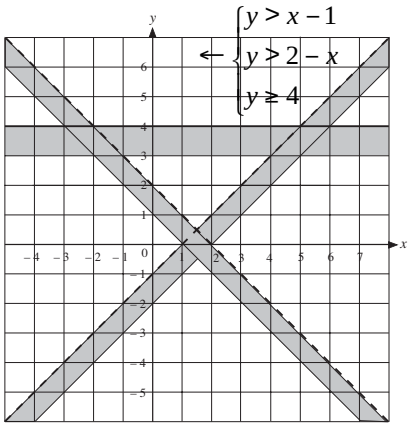

Vertices: $(2, 3)$, $(3, 3)$

(e)




Vertices: $(2, 1)$, $(2, 5)$

(f)




Vertices: $(-2, 4)$, $(5, 4)$

3. (a) $x \ge 1,\ y \ge 2,\ x + y \le 7$

(b) $x \le 5,\ y \ge 2,\ y \le x + 2$

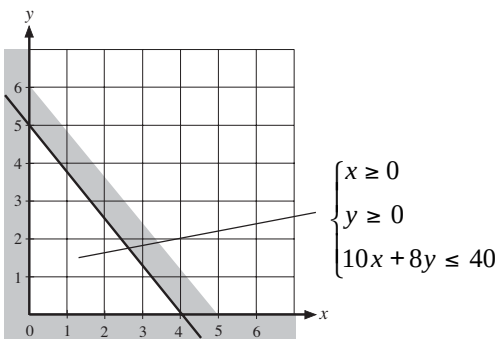
(c) $x \ge 2,\ y \le 6,\ y \ge x - 1$

(d) $x \le 3,\ y \ge -3,\ y \le x + 1$

(e) $x \ge -2,\ y \ge x - 2,\ y \le 2 - x$

(f) $x + y \ge -3,\ y \ge 2x - 3,\ 2y \le x + 3$

4. (c)



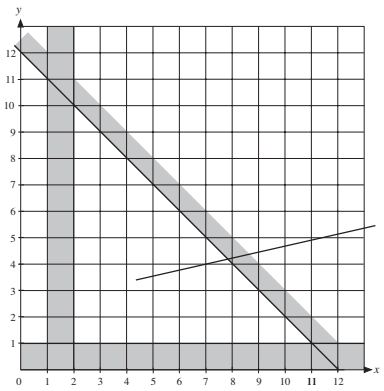

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# Text *F6 Solving Inequalities* Answers

F6.5

5. (a) (i) $x + y \leq 12$ (ii) $x \geq 2$ (iii) $y \geq 1$

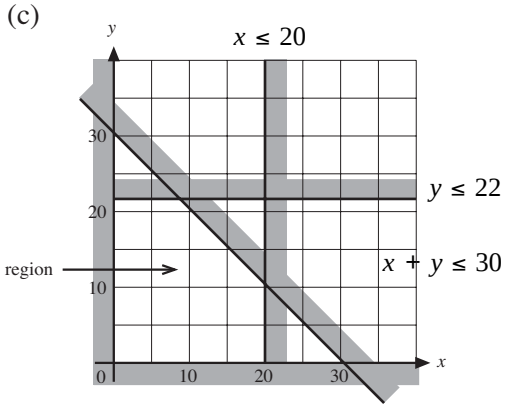
(b)



$$\begin{cases} x + y \leq 12 \\ x \geq 2 \\ y \geq 1 \end{cases}$$

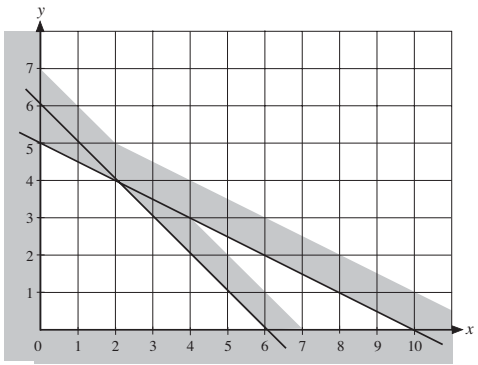
6. (a) (i) $x + y \leq 30$ (ii) $x \leq 20$ (iii) $y \leq 22$ (b) $x \geq 0,\ y \geq 0$

(c)




7. (a) $x + 2y \leq 10,\ x + y \leq 6,\ x \geq 0,\ y \geq 0$

(b)



8. (a) $x = 6$

(b) $x \leq 6;\quad y \leq \frac{1}{6}x + 5;\quad y \geq -\frac{5}{8}x + 5$

9. (b) inner triangle

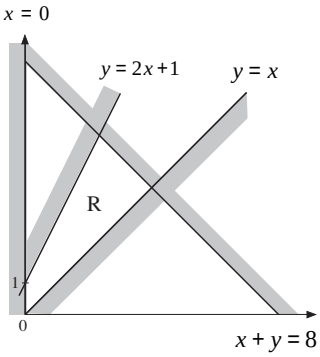
(c) 67 £2 tickets and 133 £3 tickets; £533

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# Text *F6 Solving Inequalities* Answers

F6.5

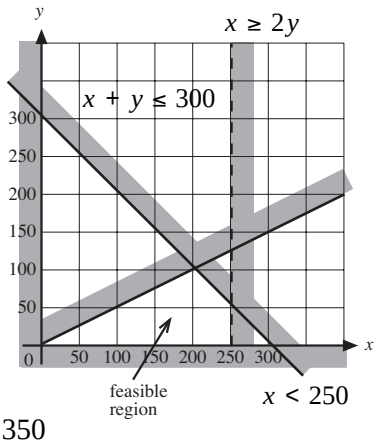
10. (a) 3, 4, 5, 6 and 7 (b)




11. (a) $x < 250$, $x + y \leq 300$, $x \geq 2y$

(c) £1000

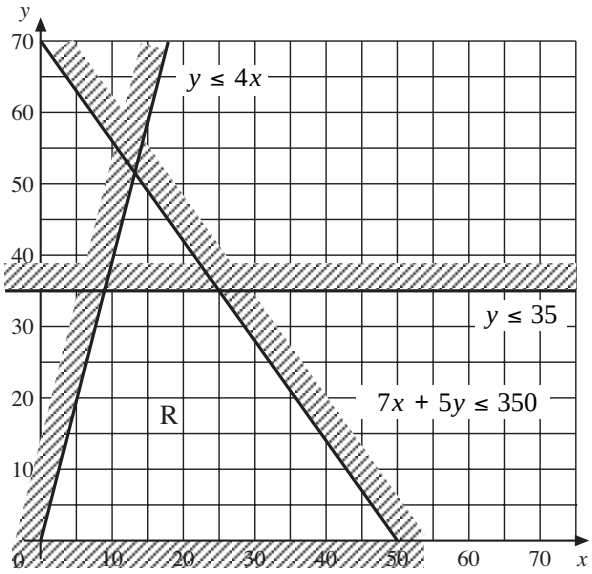
(d) 120




12. (a) $7x + 5y \leq 350$

(b) Number of small baskets must be less than or equal to 4 times the number of large baskets.
Number of small baskets must be less than or equal to 35.

(c) See grid below.




(d) $P = 2x + 3y$

(e) $x = 25$, $y = 35$ and P = £155

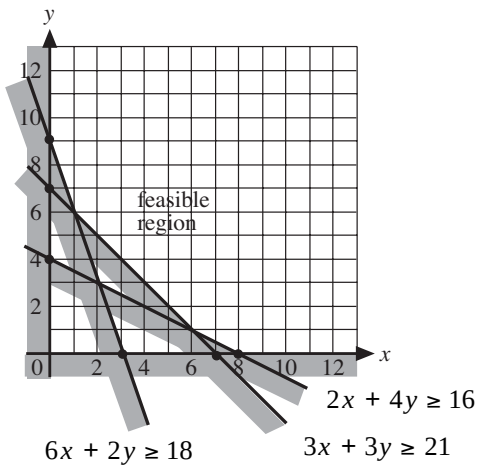
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# Text *F6 Solving Inequalities* Answers

## F6.5

13. (a) $6x + 2y \geq 18$, $3x + 3y \geq 21$, $2x + 4y \geq 16$

(b)




(c) I Xtravit and 6 Yeastalife

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