

# Penyelesaian Lengkap

## PENTAKSIRAN SUMATIF

### Kertas 1

1 C

Angka yang kelima bagi 1.93748 ialah 4, di mana  $4 < 5$ . Jadi, kita tidak perlu menambah satu kepada digit yang sebelumnya. Nombor itu betul kepada empat angka bererti ialah 1.937.

*The fifth digit of 1.93748 is 4, where  $4 < 5$ . So, we do not need to add one to the previous digit. The number correct to four significant figures is 1.937.*

2 B

$$1\,423\,000\text{ km} = 1\,423\,000\,000\text{ m}$$

$$= 1.423 \times 10^9\text{ m}$$

3 A

$$x + 1 = \frac{6}{x + 2}$$

$$(x + 1)(x + 2) = 6$$

$$x^2 + 3x + 2 - 6 = 0$$

$$x^2 + 3x - 4 = 0$$

$$(x - 1)(x + 4) = 0$$

$$x = 1 \text{ atau/or } x = -4$$

4 D

$$\frac{5x^2}{y^3z} \times \frac{2yz^2}{x}$$

$$= \frac{10x^2yz^2}{xy^3z}$$

$$= \frac{10xz}{y^2}$$

5 C

$$q^2 = \frac{\sqrt[3]{512p^3}}{\sqrt{24r}}$$

$$q^2 = \frac{8p}{2\sqrt{6r}}$$

$$q^2 = \frac{4p}{\sqrt{6r}}$$

$$p = \frac{q^2\sqrt{6r}}{4}$$

6 A

Pintasan- $y$ /y-intercept,  $c = 6$ .

$$f(x) = ax^2 + bx + 6$$

Di/At (2, 9)

$$9 = 2^2(a) + 2b + 6$$

$$4a + 2b - 3 = 0 \dots \textcircled{1}$$

Paksi simetri/Axis of symmetry,  $x = -\frac{b}{2a} = 2$

$$b = -4a \dots \textcircled{2}$$

Gantikan  $\textcircled{2}$  ke dalam  $\textcircled{1}$

Substitute  $\textcircled{2}$  into  $\textcircled{1}$

$$4a + 2(-4a) - 3 = 0$$

$$-4a - 3 = 0$$

$$4a = -3$$

$$a = -\frac{3}{4}$$

$$b = -4\left(-\frac{3}{4}\right)$$

$$= 3$$

$$f(x) = -\frac{3}{4}x^2 + 3x + 6$$

7 D

Graf bagi fungsi kuadratik  $f(x) = 2x^2 + 3$  berbentuk  $\cup$  dan mempunyai titik minimum, iaitu (0, 3). Maka, ia tidak mempunyai pintasan- $x$ .

*Graph of quadratic function  $f(x) = 2x^2 + 3$  has the shape of  $\cup$  and has a minimum point, that is (0, 3). Hence, it does not have an  $x$ -intercept.*

8 D

$$f(x) = 2x^2 - 3$$

$$g(x) = -2x^2 + 3$$

$$g(x) = rx^2 - t.$$

Secara perbandingan.

As comparison,

$$r = -2 \text{ dan/and } t = -3$$

Maka/Thus,

$$t - r$$

$$= -3 - (-2)$$

$$= -3 + 2$$

$$= -1$$

9 B

$$f(x) = ax^2 + 7x + 4$$

Di/At (5, -11),

$$a(5^2) + 7(5) + 4 = -11$$

$$25a + 35 + 4 + 11 = 0$$

$$25a = -50$$

$$a = -2$$

$$\therefore f(x) = -2x^2 + 7x + 4$$

Paksi simetri/Axis of symmetry:

$$x = -\frac{7}{2(-2)}$$

$$x = \frac{7}{4}$$

10 B

$$8 \times 9^2 = 648$$

11 D

Digit bagi suatu nombor dalam asas  $n$  terdiri daripada digit-digit kurang daripada  $n$  sahaja.

*Digits of a number in base  $n$  consists of digits which are less than  $n$  only.*

12 A

$$138_{10} = 3^4 + p(3^3) + q$$

3	138	Baki/Remainder
3	46	0
3	15	1
3	5	0
3	1	2
	0	1

$$138_{10} = 12010_3$$

$$= 3^4 + 2(3^3) + 3$$

Secara perbandingan/As comparison,

$$p = 2, q = 3$$

$$q - p = 1$$

13 A

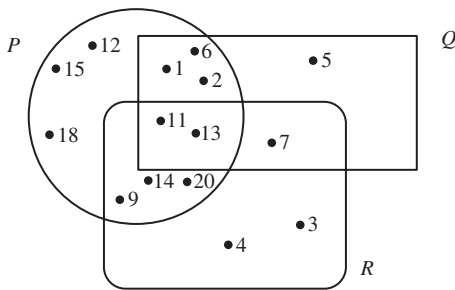
14 D

15 A

16 A

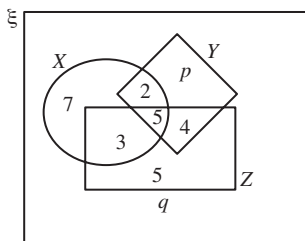
$$P \cap Q = \{1, 2, 6, 11, 13\}$$

$$P \cap R = \{9, 11, 13, 14, 20\}$$



$$(P' \cup Q) \cap R = \{3, 4, 7, 11, 13\}$$

17 D



Diberi/Given  $n(X \cap Z) \cup Y' = n(Y)$  dan/and  $n(\xi) = 37$ .

$$5 + 3 + 7 + 5 + q = 2 + 5 + 4 + p$$

$$20 + q = 11 + p$$

$$q = p - 9 \dots \textcircled{1}$$

$$n(\xi) = 37$$

$$7 + 3 + 2 + 5 + 4 + 5 + p + q = 37$$

$$p + q = 11 \dots \textcircled{2}$$

Gantikan ① ke dalam ②

Substitute ① into ②

$$p + (p - 9) = 11$$

$$2p - 9 = 11$$

$$2p = 20$$

$$p = 10$$

$$q = 1$$

$$\frac{p}{q} = 10$$

18 B

19 D

20 A

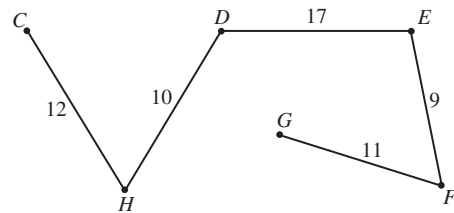
21 C

$e_1 = (E, G)$  sebab tepi  $e_1$  adalah dari bucu E ke bucu G. Ia bukan graf mudah kerana wujudnya gelung dan berbilang tepi.

$e_1 = (E, G)$  because edge  $e_1$  is from vertex E to vertex G. It is not a simple graph because there is a loop and multiple edges.

22 B

23 C



$$12 + 10 + 17 + 9 + 11 = 59$$

24 C

25 A

$$y = 5x + 4$$

Apabila/When  $x = 5$ ,

$$y = 5(5) + 4$$

$$= 29 (\geq 29)$$

Maka (5, 29) tidak memuaskan  $y > 5x + 4$ .

Hence (5, 29) does not satisfy  $y > 5x + 4$ .

26 C

27 C

$$(0, 9), (6, 3)$$

$$y = \frac{9-3}{0-6}x + 9$$

$$y = -x + 9$$

$$y \leq -x + 9, x \geq 0, y \geq 0, x < 6$$

28 D

A Laju purata/Average speed

$$= \frac{100}{\frac{80}{60}}$$

$$= 75 \text{ km j}^{-1} (\text{km h}^{-1})$$

B dan C adalah benar jika graf ialah graf laju-masa.

B and C are true only if it is a speed-time graph.

29 C

$$6400 \text{ cm} = 64 \text{ m}$$

$$0.5 \times 8 \times v = 64$$

$$v = 16$$

$$v - 6 = 16 - 6$$

$$= 10$$

$$0.5 \times (16 + 10) \times 5 = 65 \text{ m}$$

30 D

Apabila  $e = 30$  dan  $t = 10$ , kita mendapat dua titik, iaitu,

$$(0, 30) \text{ dan } \left(\frac{10}{3600}, 20\right).$$

When  $e = 30$  and  $t = 10$ , we have two points, (0, 30) and

$$\left(\frac{10}{3600}, 20\right).$$

Kadar perubahan laju  
*Rate of change of speed*  

$$= \frac{30 - 20}{\frac{10}{3600}}$$

$= -3600$

31 D

A: Julat/Range =  $9 - 4 = 5$

B: Terdapat 14 titik.  
*There are 14 dots.*

C: Kebanyakan murid mendapat skor 6.  
*Most of the students scored 6.*

32 C

Julat antara kuartil/*Interquartile range*  
 $= 180 - 165 = 15$

33 A

$$\sum x^2 = 5^2 + 9^2 + 11^2 + 13^2 + 18^2 = 720$$

$$\sum x = 5 + 9 + 11 + 13 + 18 = 56$$

Min/Mean =  $\frac{56}{5}$

Sisihan piawai/*Standard deviation*

$$= \sqrt{\frac{720}{5} - \left(\frac{56}{5}\right)^2} = 4.308$$

Tidak ada perubahan pada sisihan piawai apabila setiap data dalam suatu set ditolak dengan satu pemalar.  
*There is no change in the standard deviation when each data value in a set is subtracted by a constant.*

34 D

Varians baharu ialah 2.3 selepas didarab dengan  $x$  pada varians asal. Maka, varians asal =  $\frac{23}{10x}$ .

*New variance is 2.3 after multiplied by  $x$  to the original variance. Hence, the original variance =  $\frac{23}{10x}$ .*

35 B

Bagi setiap lambungan sebiji dadu, terdapat 6 kesudahan yang mungkin. Bagi setiap lambungan sekeping duit syiling, terdapat 2 kesudahan yang mungkin. Maka,  
*For each toss of a dice, there are 6 possible outcomes. For each toss of a coin, there are 2 possible outcomes. Thus,*  
 $n(S) = 6 \times 2 = 12$

36 B

37 C

$$\frac{102}{102 + y} = \frac{17}{55}$$

$$1734 + 17y = 5610$$

$$17y = 3876$$

$$y = 228$$

38 D

39 C

40 C

Katakan  $x$  ialah amaun dividen yang diterima.  
*Let  $x$  be the amount of dividend received.*

$$5600 + x - 12x = 925$$

$$-11x = -4675$$

$$x = 425$$

$$12x = 12 \times 425 = \text{RM}5100$$

## Kertas 2

### Bahagian/Section A

1 (a) Paksi simetri/*Axis of symmetry*

$$-\frac{b}{2a} = -4$$

$$\frac{-16}{2a} = 4$$

$$a = -2$$

(b)  $h(x) = -2x^2 - 16x + 18$

$$-2x^2 - 16x + 18 = 0$$

$$2x^2 + 16x - 18 = 0$$

$$(2x - 2)(x + 9) = 0$$

$$x = 1 \text{ atau/or } x = -9$$

2

$$\begin{array}{r} 11513, \\ + 1110, \\ \hline 12623, \end{array}$$

$$12623_7 = 7^4 + 2(7^3) + 6(7^2) + 2(7) + 3 = 3398$$

$$3398 \times 0.5 = 1699$$

5	1699	Baki/Remainder
5	339	4
5	67	4
5	13	2
5	2	3
	0	2

$$\therefore \text{RM}23244_5$$

3 (a) Palsu/*False*

Gandaan 2/*Multiples of 2*: 2, 4

Gandaan 1/*Multiples of 1*: 1, 2, 3, 4

Maka, GSTK bagi 1 dan 2 ialah 2.

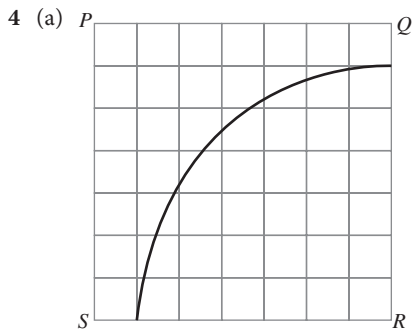
*Thus, the LCM of 1 and 2 is 2.*

(b) Jika  $d \neq e$ , maka  $\frac{d}{e} \neq 1$ .

*If  $d \neq e$ , then  $\frac{d}{e} \neq 1$ .*

$\therefore$  Benar/*True*

(c)  $x \leq -4$



(b)  $\frac{45^\circ}{360^\circ} \times 2 \times \frac{22}{7} \times 12 = \frac{66}{7}$  cm

- 5 (a) (0, 0), (6, 8)

Jarak antara Z dan O / Distance between Z and O

$$= \sqrt{6^2 + 8^2}$$

$$= 10 \text{ unit}$$

$$500 \times 10 = 5\,000 \text{ m}$$

- (b) (-10, 0), (6, 8)

Kecerunan / Gradient

$$= \frac{8 - 0}{6 - (-10)}$$

$$= \frac{8}{16}$$

$$= \frac{1}{2}$$

$$y = \frac{x}{2} + c$$

Di/At (-1, -7)

$$-7 = \frac{-1}{2} + c$$

$$c = \frac{-13}{2}$$

$$y = \frac{x}{2} - \frac{13}{2}$$

- 6  $\sqrt{13^2 - 12^2} = 5$

Diberi panjang AD = 10 m. Maka, panjang DB dan BA masing-masing ialah 24 m dan 26 m.

Given the length AD = 10 m. Thus, the length of DB and BA are 24 m and 26 m respectively.

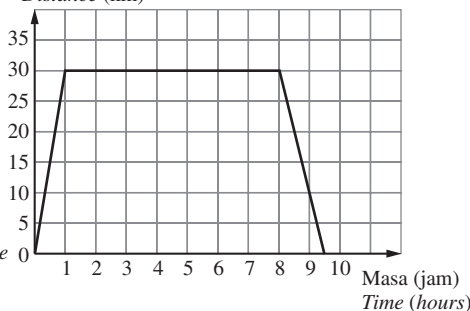
Luas kawasan untuk menanam pokok bunga

Area for planting flowers

$$= \left( \frac{1}{4} \times \frac{22}{7} \times 26^2 \right) - \left( \frac{1}{2} \times 48 \times 10 \right)$$

$$= 291.14 \text{ m}^2$$

- 7 (a) Jarak (km)  
Distance (km)



- (b) Kadar perubahan jarak bagi 1 jam yang pertama

Rate of change of distance for the 1<sup>st</sup> hour

$$= \frac{30}{1}$$

$$= 30 \text{ km j}^{-1} \text{ (km h}^{-1}\text{)}$$

Kadar perubahan jarak bagi 1 jam yang terakhir

Rate of change of distance for the last 1 hour

$$= \frac{30}{1.5}$$

$$= 20 \text{ km j}^{-1} \text{ (km h}^{-1}\text{)}$$

Perbezaan / Difference = 10 km j<sup>-1</sup> (km h<sup>-1</sup>)

- (c) 8 - 1 = 7 jam/hours

8

	<i>x</i>	<i>f</i>	<i>fx</i>	<i>x</i> <sup>2</sup>	<i>fx</i> <sup>2</sup>
	12	20	240	144	2880
	13	22	286	169	3718
	14	30	420	196	5880
	15	25	375	225	5625
	16	15	240	256	3840
<b>Jumlah Total</b>	$\Sigma x = 70$	$\Sigma f = 112$	$\Sigma fx = 1\,561$		$\Sigma fx^2 = 21\,943$

$$\text{Min/Mean} = \frac{1\,561}{112}$$

$$= 13.9375$$

$$\text{Varians/Variance} = \frac{21\,943}{112} - 13.9375^2$$

$$= 1.666$$

Sisihan piawai / Standard deviation

$$= \sqrt{1.666}$$

$$= 1.291$$

- 9 Andaikan jumlah bilangan murid ialah *y* orang.

Assume the total number of students is *y*.

Kebarangkalian murid yang lulus

$$\text{Probability of students who passed} = \frac{5}{8}$$

$$\frac{12 + 13}{y} = \frac{5}{8}$$

$$\frac{25}{y} = \frac{5}{8}$$

$$y = 40$$

Bilangan murid yang gagal

Number of students who failed

$$= 40 - 25$$

$$= 15$$

Bilangan murid lelaki yang gagal, *p*

Number of boys who failed, *p*

$$= \frac{1}{3} \times 15$$

$$= 5$$

Bilangan murid perempuan yang gagal,  $q$   
 Number of girls who failed,  $q$

$$= \frac{2}{3} \times 15$$

$$= 10$$

$$\frac{p}{q} = \frac{5}{10} = 0.5$$

10 (a)  $RM25\,800 \times 0.2 = RM5\,160$

$$\frac{RM5\,160}{6} = RM860$$

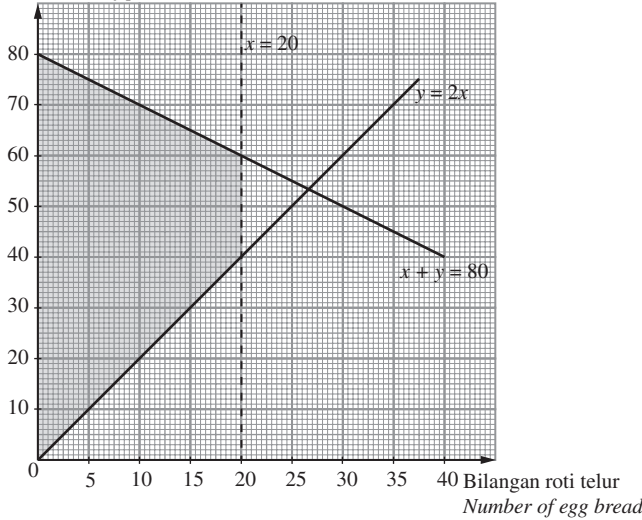
(b)  $3200 + 360 - (400 + 200 + 1\,000 + 120 + 200) - 860$   
 $= RM780$

**Bahagian/Section B**

11 (a)  $x < 20$   
 $x + y \leq 80$   
 $y \geq 2x$

(b)

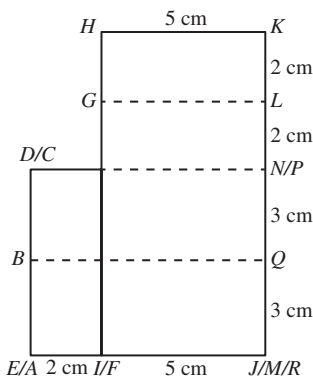
Bilangan mi udang  
 Number of prawn noodles



(c) Apabila  $x = 15$ , nilai maksimum  $y$  yang memuaskan kawasan berlorek ialah 65.  
 When  $x = 15$ , the maximum value of  $y$  that satisfies the shaded region is 65.

Jumlah jualan/Total sales  
 $= (15 \times 8) + (65 \times 10)$   
 $= RM770$

12 (a)

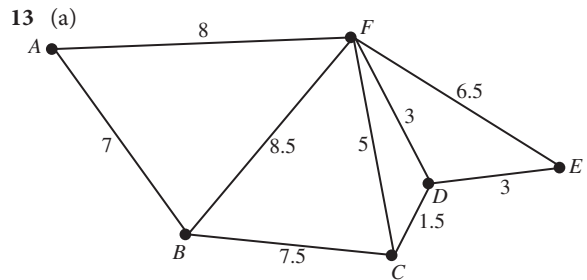


(b) (i) Luas keratan rentas seragam  
 Area of uniform cross section  
 $= 0.5(3 + 6)(2) + 4(6)$   
 $= 33$   
 Isi padu/Volume  
 $= 33 \times 7$   
 $= 231 \text{ cm}^3$

(ii)

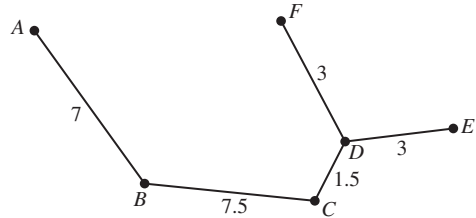
9	231	Baki/Remainder
9	25	6
9	2	7
	0	2

$\therefore 276_9$



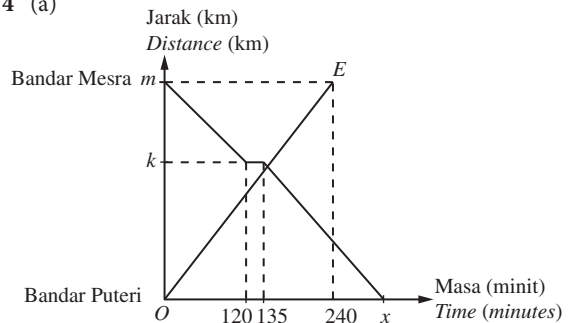
(b) Bukan pokok. Terdapat 6 bucu dan 9 tepi. Sebuah pokok harus mempunyai  $n$  bucu dan  $n - 1$  tepi.  
 Not a tree. There are 6 vertices and 9 edges. A tree has  $n$  vertices and  $n - 1$  edges.

(c)



$$7 + 7.5 + 1.5 + 3 + 3 = 22$$

14 (a)



(b) (i)  $m = 150 + 180$   
 $= 330$

(ii)  $k = m - 150$   
 $= 330 - 150$   
 $= 180$

(iii)  $90 = \frac{180}{t}$   
 $t = 2$

$$2 \text{ jam/hours} = 120 \text{ minit/minutes}$$

$$x = 135 + 120$$

$$= 255$$

$$(c) \text{ Laju purata/Average speed} = \frac{330}{\frac{240}{60}}$$

$$= 82.5 \text{ km j}^{-1} (\text{km h}^{-1})$$

15 (a)

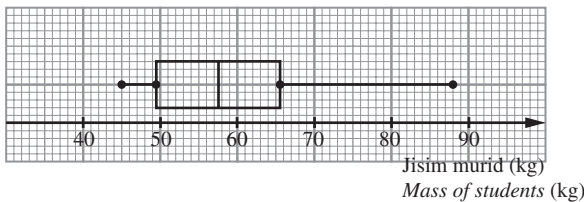
45	47	48	49	50	52	54	57
58	60	63	65	66	71	72	88

$$(i) \frac{49 + 50}{2} = 49.5$$

$$(ii) \frac{57 + 58}{2} = 57.5$$

$$(iii) \frac{65 + 66}{2} = 65.5$$

(b)



$$(c) (i) 65.5 - 49.5 = 16$$

$$(ii) 88 - 45 = 43$$

$$(iii) 88$$

### Bahagian/Section C

16 (a) (i)

1	1	1	1	0	0
4	2	1	4	2	1
	4	2	4		
	↓			↓	
	7			4	

$$\therefore 111100_2 = 74_8$$

(c) (i) Kedai B menunjukkan serakan data yang lebih kecil, iaitu,  $140 - 80 = 60$   
*Shop B shows smaller dispersion of data, that is,  $140 - 80 = 60$ .*

(ii) Min/Mean

$$= \frac{80(8) + 90(5) + 100(6) + 110(4) + 120(2) + 130(3) + 140}{29}$$

$$= \frac{2900}{29}$$

$$= 100$$

$$(iii) \frac{14}{10} = 1.4$$

17 (a) (i)  $f(x) = -(x+1)(x-7)$   
 $= -x^2 + 6x + 7$

Paksi simetri,  $-\frac{b}{2a} = -\frac{6}{2(-1)}$   
 Axis of symmetry,  $= 3$

(ii) Apabila/When  $x = 3$ ,  
 $f(x) = -3^2 + 6(3) + 7$   
 $= 16$

$$\therefore (3, 16)$$

1	0	1	0	0	0	0
1	4	2	1	4	2	1
1		2			0	
↓		↓			↓	
1		2			0	

$$\therefore 1010000_2 = 120_8$$

(ii)

	74	8
+	120	8
	214	8

(b) **Bank Jaya**

$$I = Prt$$

$$= 30\,000 \times 0.07 \times 7$$

$$= 14\,700$$

Jumlah simpanan pada akhir tahun ke-7 ialah  
 RM30 000 + RM14 700 = RM44 700.

Total savings at the end of 7<sup>th</sup> year is  
 RM30 000 + RM14 700 = RM44 700.

**Bank Gaya**

$$MV = 30\,000 \times \left(1 + \frac{0.06}{2}\right)^{2(7)}$$

$$= 45\,377.69$$

Jumlah simpanan pada akhir tahun ke-7 ialah  
 RM45 377.69.

Total savings at the end of 7<sup>th</sup> year is RM45 377.69.

$\therefore$  Encik Lee harus memilih Bank Gaya.

*Encik Lee should choose Bank Gaya.*

(b) (i) Katakan  $x$  ialah nilai yang tidak diketahui.

Let the unknown value be  $x$ .

$$\left[ 0.5 \times \left( \frac{10}{60} \right) \times 60 \right] + \left[ \frac{x-10}{60} \times 60 \right] + \left[ 0.5 \times \frac{45-x}{60} \times 160 \right] = 45 \frac{2}{3}$$

$$5 + x - 10 + \frac{4}{3}(45 - x) = 45 \frac{2}{3}$$

$$x - 5 + 60 - \frac{4}{3}x = 45 \frac{2}{3}$$

$$-\frac{x}{3} = -9 \frac{1}{3}$$

$$x = 28$$

(ii)  $28 - 10 = 18$  minit/minutes

(c) (i) a.  $n(X) = n(X')$

$$4 + 6 + f + 4f = 9 + 5 + 3 + f + 1$$

$$4f = 8$$

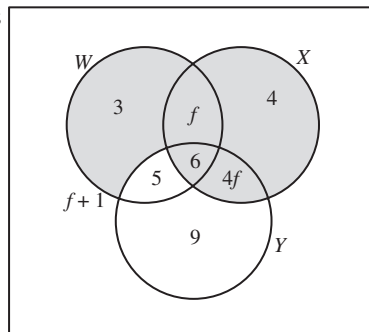
$$f = 2$$

$$n(\xi) = 6f + 28$$

$$= 6(2) + 28$$

$$= 40$$

b.  $\xi$



(ii)  $\frac{10 + 6 + 5}{40} = \frac{21}{40}$