

Penyelesaian Lengkap

Praktis 7

Praktis Formatif

7.1 Serakan Dispersion

1

Panjang (cm) Length (cm)	3 – 6	7 – 10	11 – 14	15 – 18	19 – 22
Markah Marks	36 – 40	41 – 45	46 – 50	51 – 55	56 – 60

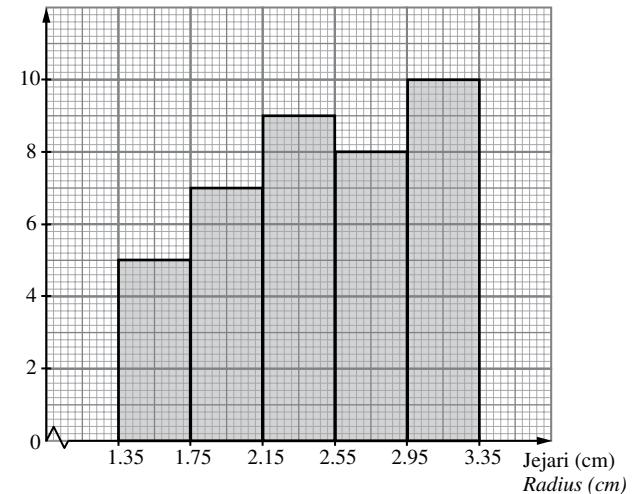
2

Panjang (cm) Length (cm)	Sempadan bawah Lower boundary	Sempadan atas Upper boundary	Titik tengah Midpoint	Saiz selang kelas Size of Class Interval
2.0 – 2.4	$\frac{1.9 + 2.0}{2} = 1.95$	$\frac{2.4 + 2.5}{2} = 2.45$	$\frac{2.0 + 2.4}{2} = 2.2$	2.45 – 1.95 = 0.5
2.5 – 2.9	$\frac{2.4 + 2.5}{2} = 2.45$	$\frac{2.9 + 3.0}{2} = 2.95$	$\frac{2.5 + 2.9}{2} = 2.7$	2.95 – 2.45 = 0.5
3.0 – 3.4	$\frac{2.9 + 3.0}{2} = 2.95$	$\frac{3.4 + 3.5}{2} = 3.45$	$\frac{3.0 + 3.4}{2} = 3.2$	3.45 – 2.95 = 0.5
3.5 – 3.9	$\frac{3.4 + 3.5}{2} = 3.45$	$\frac{3.9 + 4.0}{2} = 3.95$	$\frac{3.5 + 3.9}{2} = 3.7$	3.95 – 3.45 = 0.5
4.0 – 4.4	$\frac{3.9 + 4.0}{2} = 3.95$	$\frac{4.4 + 4.5}{2} = 4.45$	$\frac{4.0 + 4.4}{2} = 4.2$	4.45 – 3.95 = 0.5

3

Jejari (cm) Radius (cm)	Bilangan bebola Number of balls	Sempadan bawah Lower boundary	Sempadan atas Upper boundary
1.4 – 1.7	5	1.35	1.75
1.8 – 2.1	7	1.75	2.15
2.2 – 2.5	9	2.15	2.55
2.6 – 2.9	8	2.55	2.95
3.0 – 3.3	10	2.95	3.35

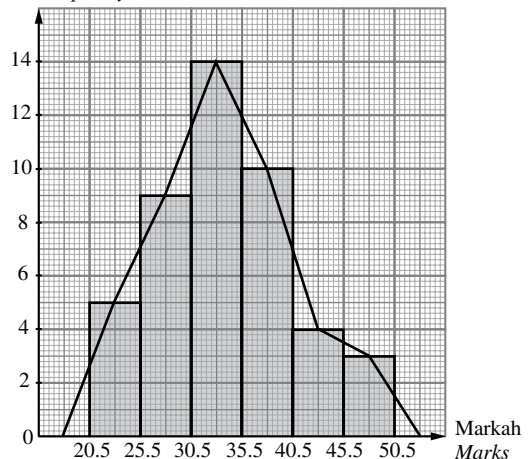
Kekerapan/Frequency



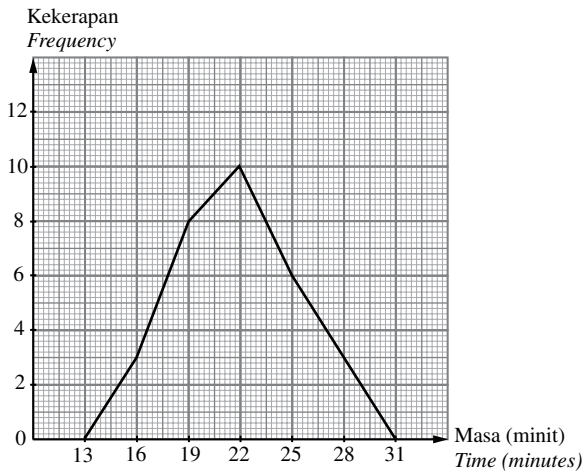
4

Markah Marks	Titik tengah Midpoint	Kekerapan Frequency
16 – 20	18	0
21 – 25	23	5
26 – 30	28	9
31 – 35	33	14
36 – 40	38	10
41 – 45	43	4
46 – 50	48	3
51 – 55	53	0

Kekerapan
Frequency

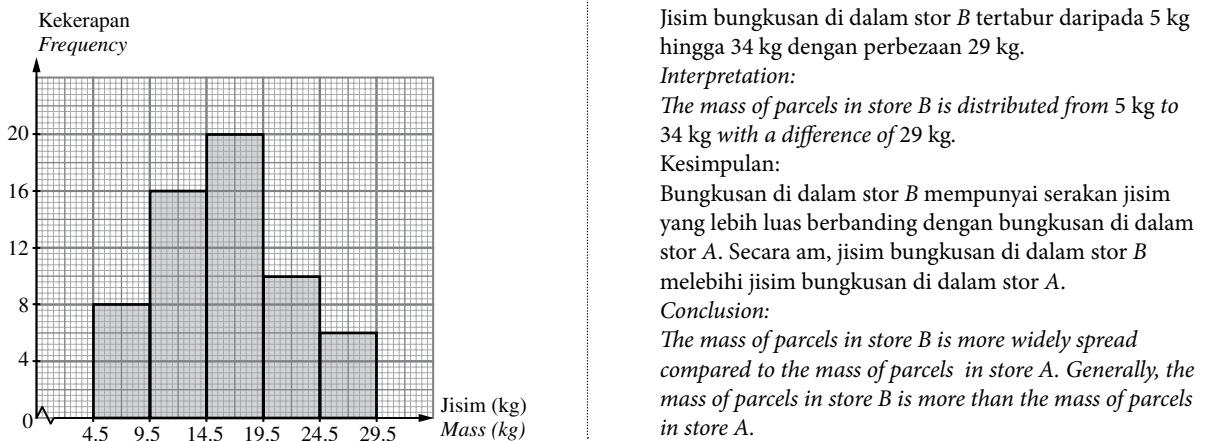


Masa (minit) Time (minutes)	Bilangan murid Number of students	Titik tengah Midpoint
12 – 14	0	13
15 – 17	3	16
18 – 20	8	19
21 – 23	10	22
24 – 26	6	25
27 – 29	3	28
30 – 32	0	31



6 Histogram A

Jisim (kg) Mass (kg)	Kekerapan Frequency	Sempadan bawah Lower boundary	Sempadan atas Upper boundary
5 – 9	8	4.5	9.5
10 – 14	16	9.5	14.5
15 – 19	20	14.5	19.5
20 – 24	10	19.5	24.5
25 – 29	6	24.5	29.5



Tafsiran:

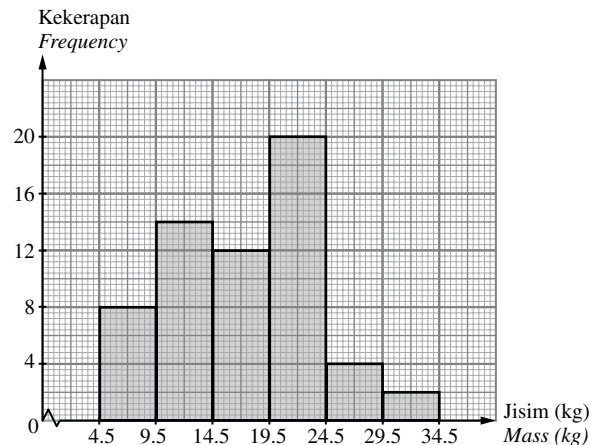
Jisim bungkusan di dalam stor A tertabur daripada 5 kg hingga 29 kg dengan perbezaan 24 kg.

Interpretation:

The mass of parcels in store A is distributed from 5 kg to 29 kg with a difference of 24 kg.

Histogram B

Jisim (kg) Mass (kg)	Kekerapan Frequency	Sempadan bawah Lower boundary	Sempadan atas Upper boundary
5 – 9	8	4.5	9.5
10 – 14	14	9.5	14.5
15 – 19	12	14.5	19.5
20 – 24	20	19.5	24.5
25 – 29	4	24.5	29.5
30 – 34	2	29.5	34.5



Tafsiran:

Jisim bungkusan di dalam stor B tertabur daripada 5 kg hingga 34 kg dengan perbezaan 29 kg.

Interpretation:

The mass of parcels in store B is distributed from 5 kg to 34 kg with a difference of 29 kg.

Kesimpulan:

Bungkusan di dalam stor B mempunyai serakan jisim yang lebih luas berbanding dengan bungkusan di dalam stor A. Secara am, jisim bungkusan di dalam stor B melebihi jisim bungkusan di dalam stor A.

Conclusion:

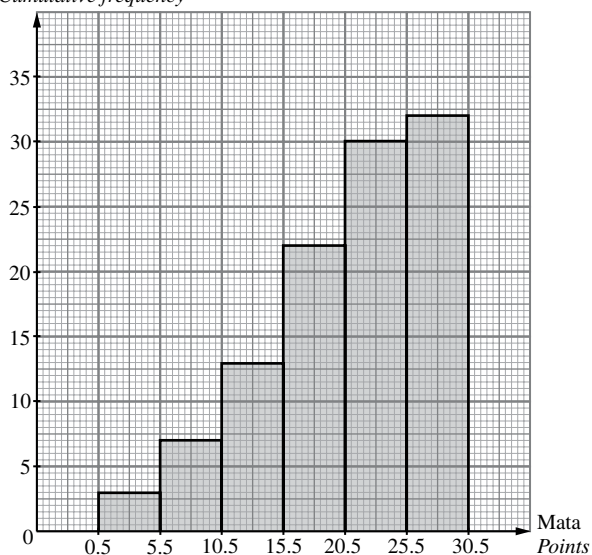
The mass of parcels in store B is more widely spread compared to the mass of parcels in store A. Generally, the mass of parcels in store B is more than the mass of parcels in store A.

7 (a)

Mata Points	Kekerapan Frequency	Sempadan bawah Lower boundary	Sempadan atas Upper boundary	Kekerapan longgokan Cumulative frequency
1 – 5	3	0.5	5.5	3
6 – 10	4	5.5	10.5	7
11 – 15	6	10.5	15.5	13
16 – 20	9	15.5	20.5	22
21 – 25	8	20.5	25.5	30
26 – 30	2	25.5	30.5	32

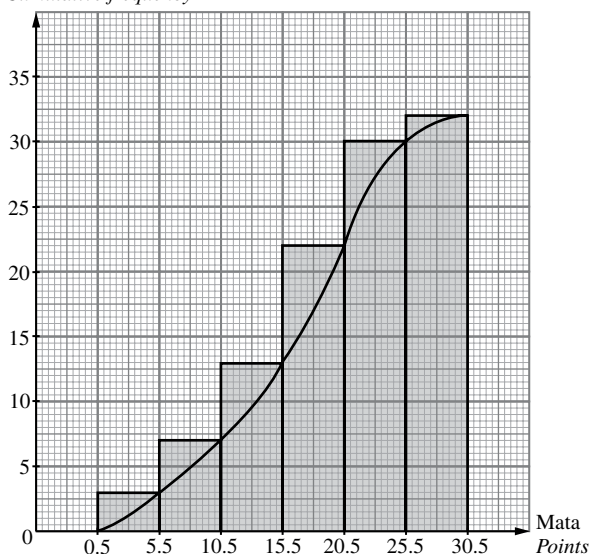
(i)

Kekerapan longgokan
Cumulative frequency



(ii)

Kekerapan longgokan
Cumulative frequency



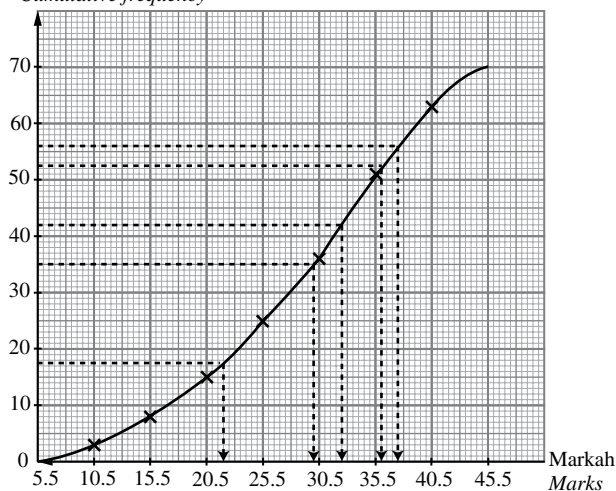
(b) Ogif ialah graf kekerapan longgokan yang melalui semua titik (sempadan atas, kekerapan longgokan) yang bermula dengan sifar.

Ogive is a cumulative frequency graph that passes through all the points (upper boundary, cumulative frequency) starting from zero.

8

Markah Marks	Kekerapan Frequency	Sempadan atas Upper boundary	Kekerapan longgokan Cumulative frequency
1 – 5	0	5.5	0
6 – 10	3	10.5	3
11 – 15	5	15.5	8
16 – 20	7	20.5	15
21 – 25	10	25.5	25
26 – 30	11	30.5	36
31 – 35	15	35.5	51
36 – 40	12	40.5	63
41 – 45	7	45.5	70

Kekerapan longgokan
Cumulative frequency



(a) $\frac{70}{4} = 17.5$ orang murid/students

Daripada ogif, kuartil pertama, $K_1 = 22$
From ogive, the first quartile

(b) $\frac{70}{2} = 35$ orang murid/*students*

Daripada ogif/*from ogive*, median, $m = 30$

(c) $\frac{3}{4} \times 70 = 52.5$ orang murid
students

Daripada ogif, kuartil ketiga
From ogive, the third quartile
 $K_3 = 36$

(d) $\frac{60}{100} \times 70 = 42$ orang murid
students

Daripada ogif, persentil ke-60
From ogive, the 60th percentile
 $= 32.5$

(e) $\frac{80}{100} \times 70 = 56$ orang murid
students

Daripada ogif, persentil ke-80
From ogive, the 80th percentile
 $= 37.5$

(f) $\frac{43}{70} \times 100\% = 61.43\%$

(g) $70 - 60 = 10$

7.2 Sukatan Serakan

Measures of Dispersion

- 1 (a) Julat = Titik tengah kelas tertinggi – Titik tengah kelas terendah

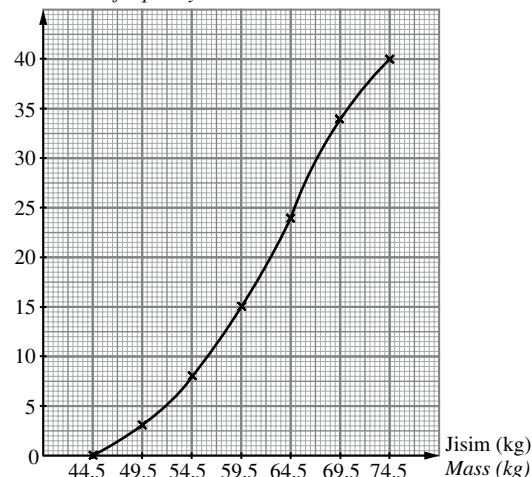
Range = Highest midpoint – lowest midpoint

$$\begin{aligned} &= \frac{70 + 74}{2} - \frac{45 + 49}{2} \\ &= 72 - 47 \\ &= 25 \text{ kg} \end{aligned}$$

(b)

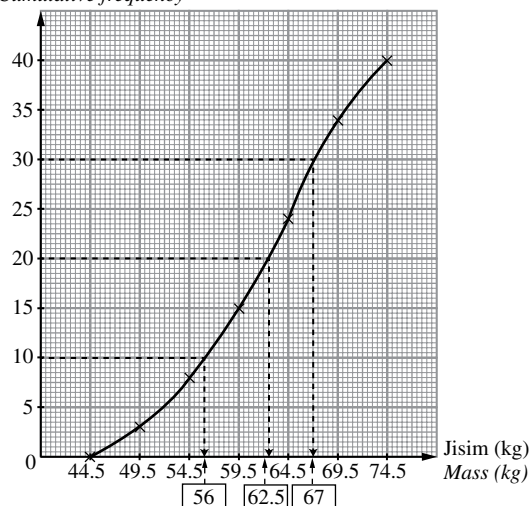
Jisim (kg) Mass (kg)	Kekerapan (f) Frequency (f)	Sempadan atas Upper boundary	Kekerapan longgokan Cumulative frequency
40 – 44	0	44.5	0
45 – 49	3	49.5	3
50 – 54	5	54.5	8
55 – 59	7	59.5	15
60 – 64	9	64.5	24
65 – 69	10	69.5	34
70 – 74	6	74.5	40

Kekerapan longgokan
Cumulative frequency



(c)

Kekerapan longgokan
Cumulative frequency



$$\frac{1}{4} \times 40 = 10 \text{ orang/persons}$$

Kuartil pertama, $K_1 = 56$ kg

The first quartile,

$$\frac{1}{2} \times 40 = 20 \text{ orang/persons}$$

Median, $m = 62.50$ kg

$$\frac{3}{4} \times 40 = 30 \text{ orang/persons}$$

Kuartil ketiga, $K_3 = 67$ kg

The third quartile,

Julat antara kuartil = Kuartil ketiga – Kuartil pertama

Interquartile range = Third quartile – First quartile

$$= K_3 - K_1$$

$$= 67 - 56$$

$$= 11 \text{ kg}$$

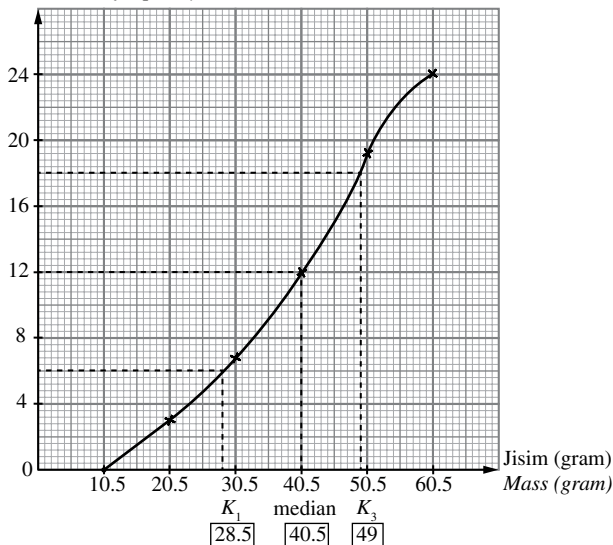
(d)	Jisim (kg) Mass (kg)	Kekerapan (f) Frequency (f)	Titik tengah (x) Midpoint (x)	fx	fx ²
	45 – 49	3	47	141	6 627
	50 – 54	5	52	260	13 520
	55 – 59	7	57	399	22 743
	60 – 64	9	62	558	34 596
	65 – 69	10	67	670	44 890
	70 – 74	6	72	432	31 104
		$\Sigma f = 40$		$\Sigma fx = 2 460$	$\Sigma fx^2 = 153 480$

$$\text{Varians/Variance} = \left(\frac{153\,480}{40} \right) - \left(\frac{2\,460}{40} \right)^2 = 54.75 \text{ kg}^2$$

$$\text{Sisihan piawai/Standard deviation} = \sqrt{54.75} = 7.399 \text{ kg}$$

2 (a)	Jisim(gram) Mass(gram)	Kekerapan Frequency	Sempadan atas Upper boundary	Kekerapan longgokan Cumulative frequency
	1 – 10	0	10.5	0
	11 – 20	3	20.5	3
	21 – 30	4	30.5	7
	31 – 40	5	40.5	12
	41 – 50	7	50.5	19
	51 – 60	5	60.5	24

(b)
Kekerapan longgokan
Cumulative frequency



$$\frac{24}{4} = 6 \text{ bungkusan/packets}$$

Daripada ogive, kuartil pertama, $K_1 = 28.5$
From the ogive, the first quartile,

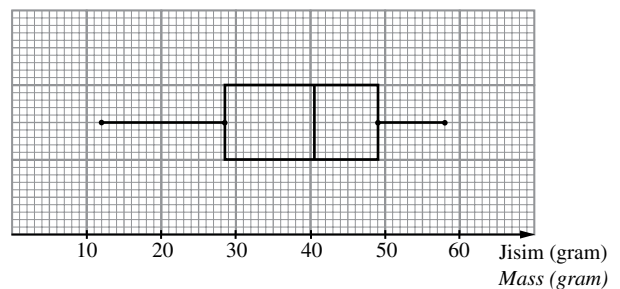
$$\frac{24}{2} = 12 \text{ bungkusan/packets}$$

Daripada ogive, median, $m = 40.5$
From the ogive, the median,

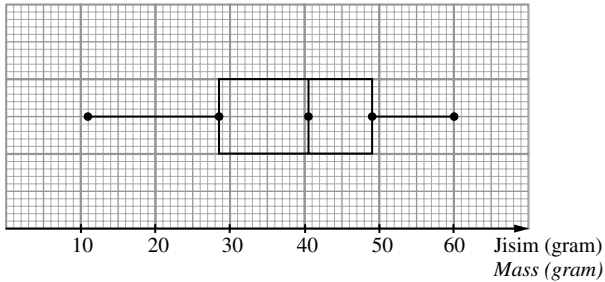
$$\frac{3}{4} \times 24 = 18 \text{ bungkusan/packets}$$

Daripada ogive, kuartil ketiga, $K_3 = 49$
From the ogive, the third quartile,

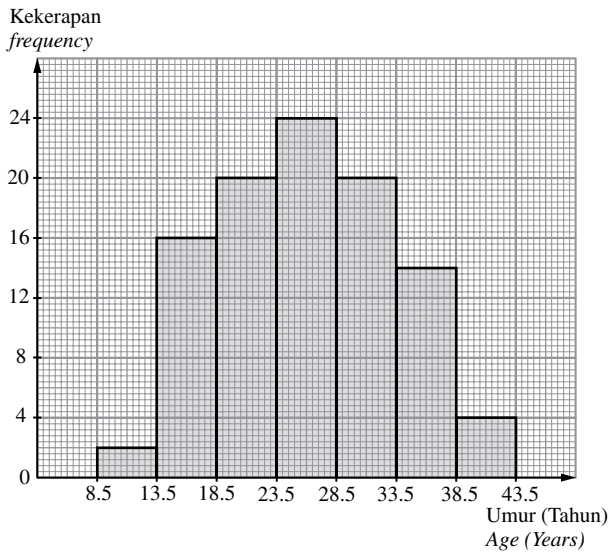
- (c) Nilai terkecil/The smallest value = 11
Nilai terbesar/The largest value = 58



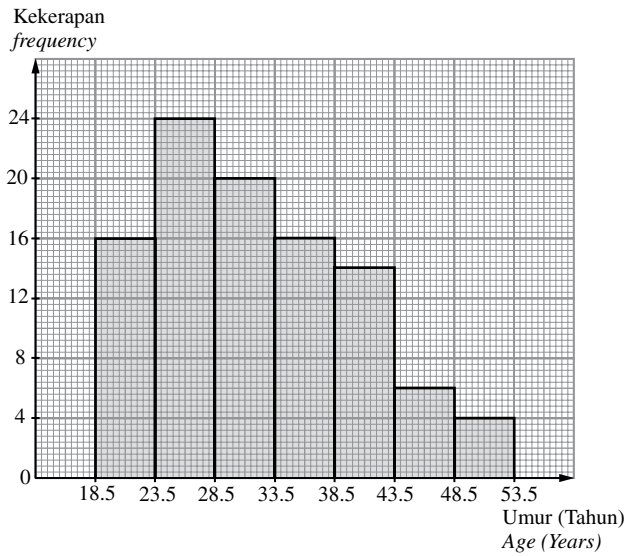
- (d) Nilai terkecil (had bawah bagi selang kelas terendah) = 11
The smallest value (the lower limit of the lowest class) = 11
Nilai terbesar (had atas bagi selang kelas tertinggi) = 60
The largest value (the upper limit of the highest class) = 60



3 Histogram A bagi taburan umur untuk expo Pendidikan
Histogram A for the distribution of age for education expo



Histogram B bagi taburan umur untuk expo Pekerjaan
Histogram B for the distribution of age for occupation expo



Taburan bagi set data A adalah hampir simetri. Taburan bagi set data B adalah lebih tertumpu pada bahagian umur yang lebih rendah.

Umur bagi pelawat yang melawat expo pekerjaan adalah lebih tinggi daripada umur bagi pelawat yang melawat expo pendidikan. Julat umur bagi pelawat yang melawat kedua-dua expo itu adalah sama.

Sisihan piawai bagi taburan A = 7.314

Sisihan piawai bagi taburan B = 8.264

Taburan A mempunyai sisihan piawai yang lebih kecil, maka data dalam taburan A kurang terserak berbanding dengan taburan B.

The distribution of data in set A is nearly symmetrical.

The distribution of data in set B is more focus on the lower age group.

The age of visitors who visited the occupation expo is higher than the age of visitors who visited the education expo. The range of age for visitors who visited both the expos are equal.

Standard deviation for distribution A = 7.314

Standard deviation for distribution B = 8.264

Distribution A has a smaller standard deviation, therefore data in distribution A is less dispersed compared to distribution B.

4 (a) Perenang/Swimmer P

Masa (saat) Time (seconds)	Kekerapan (perenang P) Frequency (swimmer P)	Titik tengah (x) Midpoint (x)	fx	fx ²
28.20 – 28.29	1	28.245	28.245	797.78
28.30 – 28.39	2	28.345	56.69	1 606.88
28.40 – 28.49	1	28.445	28.445	809.12
28.50 – 28.59	2	28.545	57.09	1 629.63

Masa (saat) Time (seconds)	Kekerapan (perenang P) Frequency (swimmer P)	Titik tengah (x) Midpoint (x)	fx	fx ²
28.60 – 28.69	2	28.645	57.29	1 641.07
28.70 – 28.79	1	28.745	28.745	826.28
28.80 – 28.89	1	28.845	28.845	832.03
	$\Sigma f = 10$		$\Sigma fx = 285.35$	$\Sigma fx^2 = 8 142.79$

$$\text{Min/Mean, } \bar{x} = \frac{285.35}{10} = 28.535 \text{ saat/seconds}$$

$$\begin{aligned} \text{Sisihan piawai/Standard deviation, } \sigma &= \sqrt{\frac{8 142.79}{10} - \left(\frac{285.35}{10}\right)^2} \\ &= \sqrt{0.032775} = 0.1810 \text{ saat/seconds} \end{aligned}$$

Perenang/Swimmer Q

Masa (saat) Time (seconds)	Kekerapan (perenang Q) Frequency (swimmer Q)	Titik tengah (x) Midpoint (x)	fx	fx ²
28.20 – 28.29	0	28.245	0	0
28.30 – 28.39	2	28.345	56.69	1 606.88
28.40 – 28.49	3	28.445	85.335	2 427.35
28.50 – 28.59	2	28.545	57.09	1 629.63
28.60 – 28.69	1	28.645	28.645	820.54
28.70 – 28.79	1	28.745	28.745	826.28
28.80 – 28.89	1	28.845	28.845	832.03
	$\Sigma f = 10$		$\Sigma fx = 285.35$	$\Sigma fx^2 = 8 142.71$

$$\text{Min/Mean, } \bar{x} = \frac{285.35}{10} = 28.535 \text{ saat/seconds}$$

$$\begin{aligned} \text{Sisihan piawai/Standard deviation, } \sigma &= \sqrt{\frac{8 142.71}{10} - \left(\frac{285.35}{10}\right)^2} \\ &= \sqrt{0.0251775} \\ &= 0.1587 \text{ saat/seconds} \end{aligned}$$

- (b) Perenang P dan Q mempunyai min masa yang sama. Perenang Q mempunyai nilai sisihan piawai yang lebih kecil. Maka, perenang Q lebih konsisten daripada perenang P dengan nilai perbezaan sisihan piawai ialah 0.0223 saat. Swimmers P and Q have the same value of mean. Swimmer Q has a smaller value of standard deviation. Swimmer Q is more consistent than swimmer P with a difference in the value of standard deviation of 0.0223 seconds.

Praktis Sumatif

Kertas 1

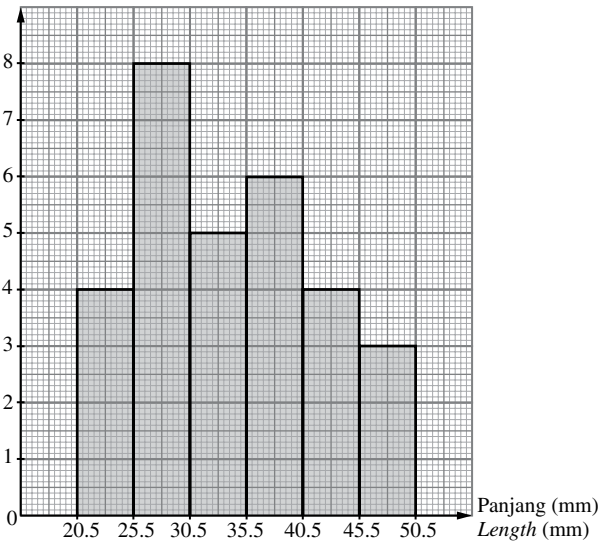
1 C 2 A 3 A 4 D 5 C 6 B 7 B

Kertas 2

Bahagian/Section B

1 (a)

Kekerapan
Frequency

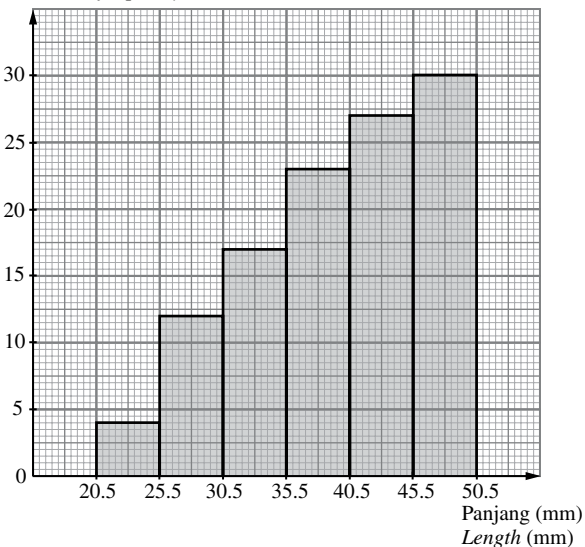


(b)

Panjang (mm) Length (mm)	Bilangan paku Number of nails	Kekerapan longgokan Cumulative frequency
21 – 25	4	4
26 – 30	8	12
31 – 35	5	17
36 – 40	6	23
41 – 45	4	27
46 – 50	3	30

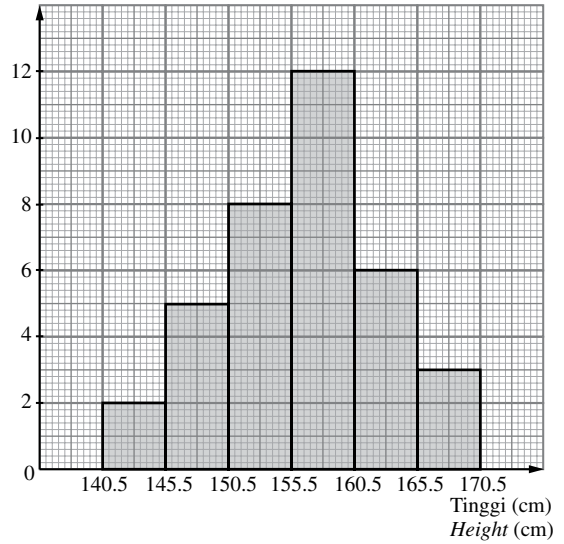
(c)

Kekerapan longgokan
Cumulative frequency



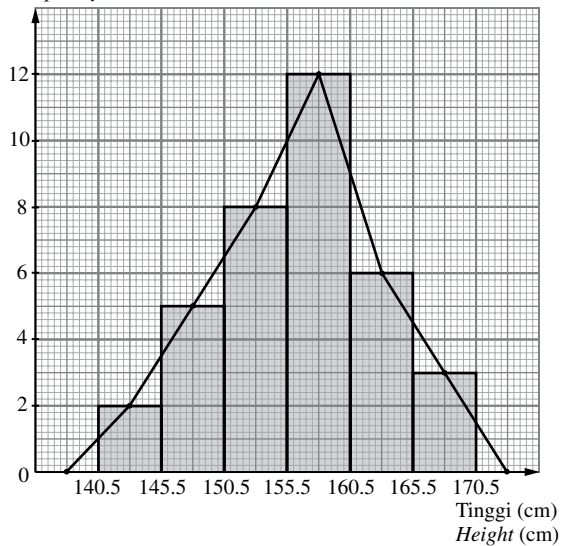
2 (a)

Kekerapan
Frequency



(b)

Kekerapan
Frequency

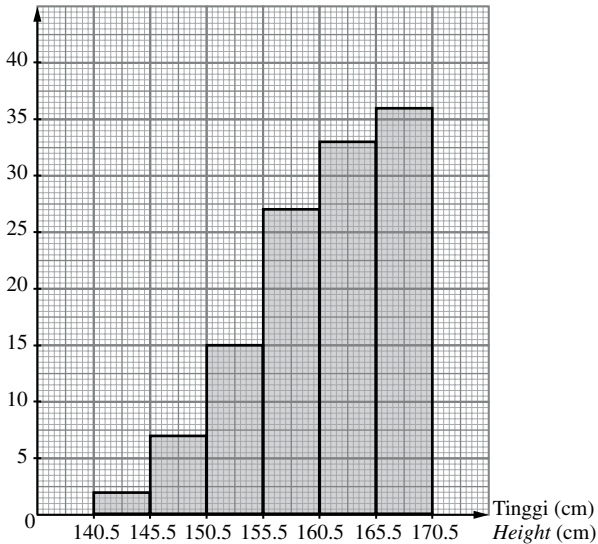


(c)

Tinggi (cm) Height (cm)	Bilangan murid Number of students	Kekerapan longgokan Cumulative frequency
141 – 145	2	2
146 – 150	5	7
151 – 155	8	15
156 – 160	12	27
161 – 165	6	33
166 – 170	3	36

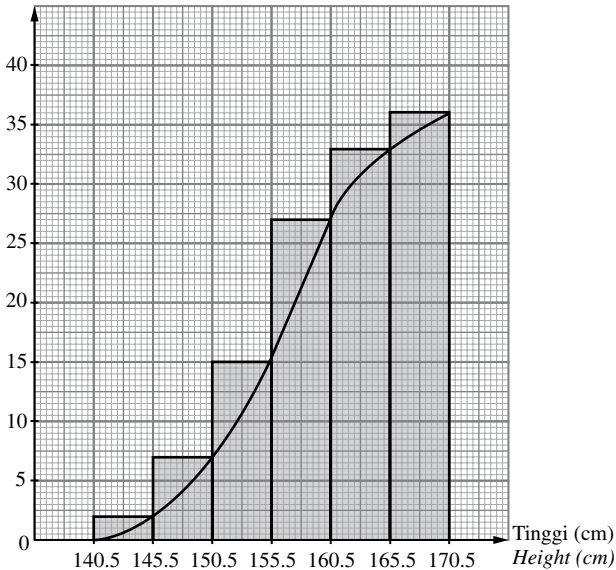
(d)

Kekerapan longgokan
Cumulative frequency



(e)

Kekerapan longgokan
Cumulative frequency



3 (a) $3 + 7 + 12 + 9 + 5 + 2$
 $= 38$ orang/persons

(b) $10 - 12$ minit/minutes

(c) $9 + 5 + 2 = 16$ orang/persons

(d)

Masa menunggu (minit) Waiting time (minutes)	4 – 6	7 – 9	10 – 12	13 – 15	16 – 18	19 – 21
Bilangan pelanggan Number of customers	3	7	12	9	5	2

(e) $12 + 9 + 5 = 26$ orang/persons

(f) $\frac{10}{38} \times 360^\circ = 94.74^\circ$

4 (a)

Jadual kekerapan kutipan derma kelas A

Frequency table for the collection of donations of class A

Kutipan derma (RM) Collection of donations (RM)	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70
Kekerapan Frequency	2	3	5	10	12	8

Jadual kekerapan kutipan derma kelas B

Frequency table for the collection of donations of class B

Kutipan derma (RM) Collection of donations (RM)	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60
Kekerapan Frequency	11	12	8	5	4

(b) Kelas A mempunyai serakan yang lebih besar iaitu dari RM11 hingga RM70 manakala kelas B dari RM11 hingga RM60.
 Class A has a larger dispersion that is from RM11 to RM70 whereas class B from RM11 to RM60.

(c) Kelas/Class A

$$12 + 8 = 20$$

$$\text{Kelas/Class B} = 4$$

(d) Kelas/Class A

$$\frac{5}{40} \times 100\% = 12.5\%$$

$$\text{Kelas/Class B}$$

$$\frac{23}{40} \times 100\% = 57.5\%$$

- (e) Kelas A terpesong ke kiri dan kelas B terpesong ke kanan.
Class A is skewed to the left and class B is skewed to the right.

5 (a) $h + 30 + 25 + 16 + 6 = 100$
 $h = 23$

$k + 26 + 20 + 14 + 12 = 100$
 $k = 28$

- (b) Syarikat Y kerana masa bekerja seminggu adalah dari 31 jam hingga 55 jam manakala masa bekerja seminggu untuk syarikat X ialah dari 41 jam hingga 65 jam.

Company Y because its weekly working hours is from 31 hours to 55 hours while weekly working hours for company X is from 41 hours to 65 hours.

- (c) Syarikat/Company X

$\frac{25 + 16 + 6}{100} \times 100\% = 47\%$

Syarikat/Company Y

$\frac{12}{100} \times 100\% = 12\%$

- (d) Tiada perbezaan sebab kedua-dua syarikat mempunyai perbezaan masa terpanjang dan masa terpendek yang sama, iaitu 24 jam.

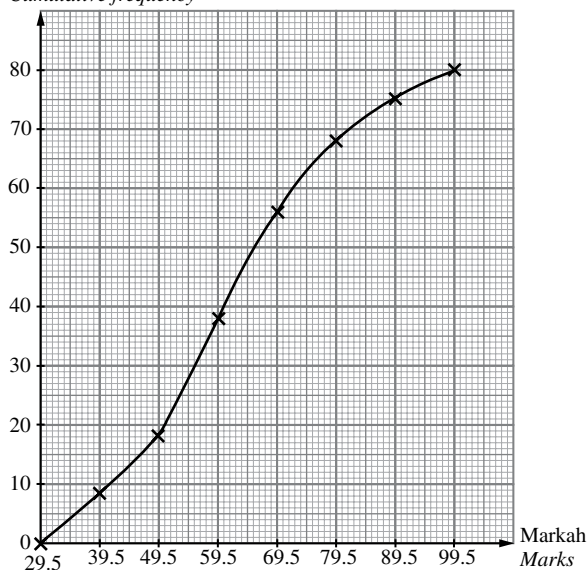
No difference because both the companies have the same difference between the longest and shortest hours, that is 24 hours.

Bahagian/Section C

6 (a) Markah Marks	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
Kekerapan Frequency	9	9	20	18	12	7	5
Sempadan atas Upper boundary	39.5	49.5	59.5	69.5	79.5	89.5	99.5
Kekerapan longgokan Cumulative frequency	9	18	38	56	68	75	80

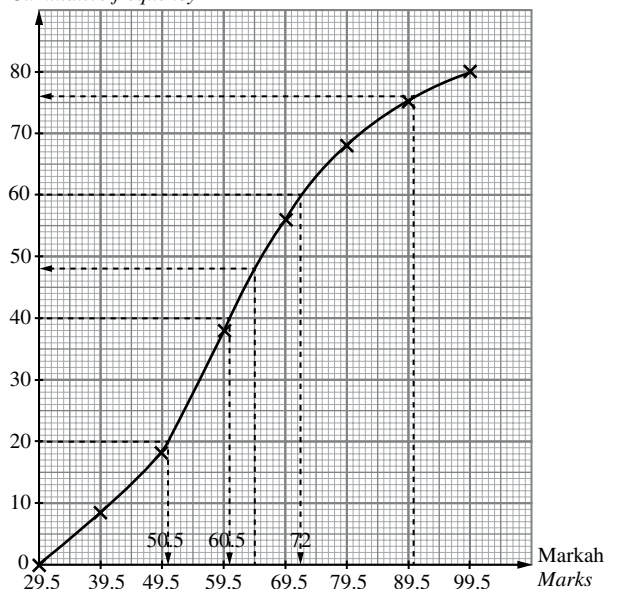
(b)

Kekerapan longgokan
Cumulative frequency



(c)

Kekerapan longgokan
Cumulative frequency



(i) nilai data ke - $\left(\frac{1}{4} \times 80\right)$
 = nilai data ke-20
 the $\left(\frac{1}{4} \times 80\right)$ th value
 = the 20th value
 = 50.5 markah/marks

(ii) nilai data ke - $\left(\frac{1}{2} \times 80\right)$
 = nilai data ke-40
 the $\left(\frac{1}{2} \times 80\right)$ th value
 = the 40th value
 = 60.5 markah/marks

(iii) nilai data ke - $\left(\frac{3}{4} \times 80\right)$
 = nilai data ke-60
 the $\left(\frac{3}{4} \times 80\right)$ th value
 = the 60th value
 = 72 markah/marks

(d) $\frac{76}{80} \times 100 = 95$

$n = 95$

(e) $80 - 76 = 4$

(f) $80 - 48 = 32$

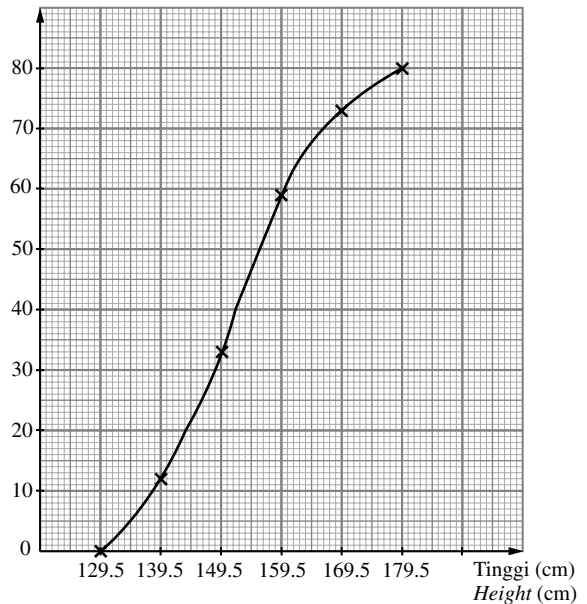
$\frac{32}{80} \times 100\% = 40\%$

7 (a)

Tinggi (cm) Height (cm)	120 - 129	130 - 139	140 - 149	150 - 159	160 - 169	170 - 179
Bilangan pelajar Number of students	0	12	21	26	14	7
Kekerapan longgokan Cumulative frequency	0	12	33	59	73	80
Sempadan atas Upper boundary	129.5	139.5	149.5	159.5	169.5	179.5

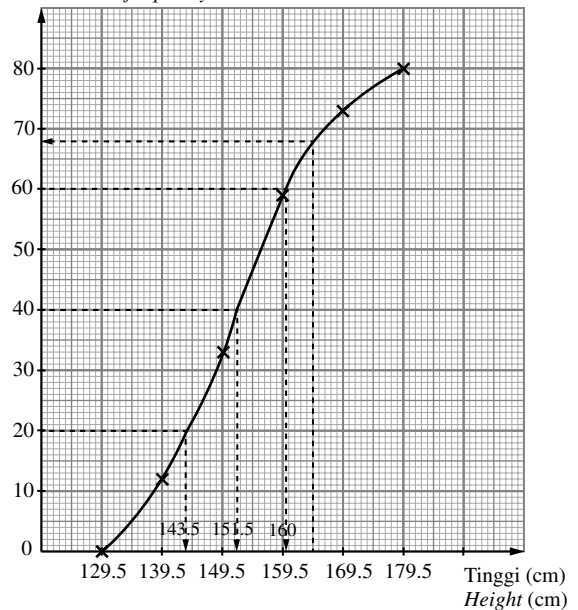
(b)

Kekerapan longgokan
Cumulative frequency



(c)

Kekerapan longgokan
Cumulative frequency



(i) nilai data ke - $\left(\frac{1}{4} \times 80\right)$
 = nilai data ke-20
 the $\left(\frac{1}{4} \times 80\right)$ th value
 = the 20th value
 = 143.5 cm

(ii) nilai data ke - $\left(\frac{1}{2} \times 80\right)$
 = nilai data ke-40
 the $\left(\frac{1}{2} \times 80\right)$ th value
 = the 40th value
 = 151.5 cm

(iii) nilai data ke - $\left(\frac{3}{4} \times 80\right)$
 = nilai data ke-60
 the $\left(\frac{3}{4} \times 80\right)$ th value
 = the 60th value
 = 160 cm

(iv) Julat antara kuartil = 160 cm - 143.5 cm
 = 16.5 cm
 Beza antara ketinggian yang paling tinggi dengan ketinggian yang paling rendah yang berada pada bahagian tengah taburan ialah 16.5 cm.

*Interquartile range = 160 cm - 143.5 cm
 = 16.5 cm*

The difference between the greatest height and the shortest height that lies in the middle of the distribution is 16.5 cm.

(v) $80 - 68 = 12$ orang/persons
 (d)

