

JAWAPAN

BAB 4

Lukisan Berskala Scale Drawings

1.

| | Ukuran pada lukisan <i>Measurement on drawing</i> | Ukuran sebenar objek <i>Actual measurement of object</i> | Nisbah ukuran pada lukisan kepada ukuran sebenar objek <i>Ratio of the measurement on drawing to the actual measurement of object</i> |
|-------------------------|--|---|--|
| Tinggi <i>Height</i> | 15 cm | 1.5 m | 15 cm : 1.5 m = 15 cm : 150 cm = 1 : 10 |
| Lebar <i>Width</i> | 18 cm | 1.8 m | 18 cm : 1.8 m = 18 cm : 180 cm = 1 : 10 |

Dua nisbah di atas adalah sama.
Ukuran pada lukisan adalah berkadaran
dengan ukuran sebenar objek.

The two ratios are equal. The measurement on drawing are proportional to the actual measurement of object.

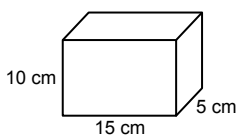
2. (a) Semua ukuran pada lukisan I, lukisan II dan lukisan III adalah berkadaran dengan ukuran pada objek ABCDEF manakala saiz sudut tidak berubah.

All measurements on the drawing I, drawing II and drawing III are proportional to the measurement of the object ABCDEF whereas angle size is unchanged.

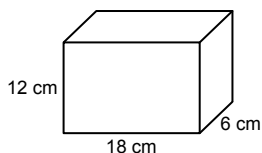
- (b) Lukisan I, lukisan II dan lukisan III ialah lukisan berskala bagi objek ABCDEF.

The drawing I, drawing II and drawing III are scale drawing of the object ABCDEF.

3.



(✓)



(✓)

4.

1 cm pada lukisan berskala mewakili 20 cm pada objek sebenar
1 cm on the scale drawing represents 20 cm on the real object

1 cm pada lukisan berskala mewakili 0.5 mm pada objek sebenar
1 cm on the scale drawing represents 0.5 mm on the real object

1 cm pada lukisan berskala mewakili 10 mm pada objek sebenar
1 cm on the scale drawing represents 10 mm on the real object

1 : 1

1 : $\frac{1}{20}$

1 : 20

5.

| Rajah <i>Diagram</i> | Skala / Scale | | |
|-------------------------|----------------|--------|---------------------|
| | Nisbah / Ratio | 1 : n | |
| II | P'Q' : PQ | 1 : 3 | 1 : 3 |
| | Q'R' : QR | 2 : 6 | 1 : 3 |
| III | P'Q' : PQ | 5 : 3 | 1 : $\frac{3}{5}$ |
| | Q'R' : QR | 10 : 6 | 1 : $\frac{3}{5}$ |
| IV | P'Q' : PQ | 2 : 3 | 1 : 1 $\frac{1}{2}$ |
| | Q'R' : QR | 4 : 6 | 1 : 1 $\frac{1}{2}$ |
| V | P'Q' : PQ | 3 : 3 | 1 : 1 |
| | Q'R' : QR | 6 : 6 | 1 : 1 |

$n > 1$

Lukisan adalah lebih kecil daripada objek.
The drawings are smaller than the objects.

1 : n

$n = 1$

Lukisan adalah sama saiz dengan objek.
The drawings are same size as the objects.

$n < 1$

Lukisan adalah lebih besar daripada objek.
The drawings are larger than the objects.

6. (a) Skala/ Scale = 21 : 84
 $= 21 \div 21 : 84 \div 21$
 $= 1 : 4$

(b) Skala/ Scale = 1 : 1

(c) Skala/ Scale = 4 : 3
 $= 1 : \frac{3}{4}$

(d) Skala/ Scale = 2 : 1
 $= 1 : \frac{1}{2}$

(e) Skala/ Scale = 0.5 : 1
 $= 1 : 2$

7. (a) $\frac{1}{40\,000} = \frac{\text{Panjang sungai pada peta}}{\text{Length of river on the map}} = \frac{2\text{ km}}{2\text{ km}}$

Panjang sungai pada peta
 Length of river on the map
 $= \frac{1}{40\,000} \times 2$
 $= 0.00005\text{ km}$
 $= 5\text{ cm}$

(b) $\frac{1}{4\,000} = \frac{10\text{ cm}}{\text{Panjang sebenar / Actual length}}$

Panjang sebenar / Actual length
 $= 4\,000 \times 10$
 $= 40\,000\text{ cm}$
 $= 400\text{ m}$

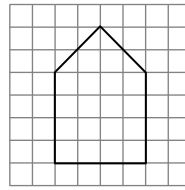
(c) $\frac{1}{4} = \frac{4\text{ cm}}{\text{Panjang sebenar / Actual length}}$

Panjang sebenar/ Actual length
 $= \frac{1}{4} \times 4$
 $= 1\text{ cm}$

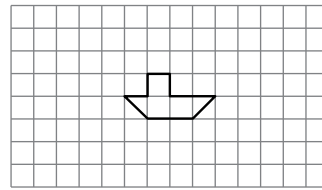
(d) $\frac{1}{3} = \frac{\text{Panjang LM pada lukisan}}{\text{Length of LM on the drawing}} = \frac{15\text{ cm}}{15\text{ cm}}$

Panjang LM pada lukisan
 Length of LM on the drawing
 $= 3 \times 15$
 $= 45\text{ cm}$

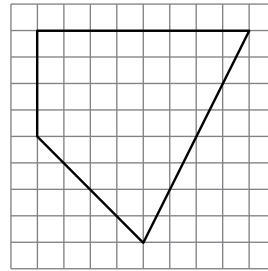
8. (a)



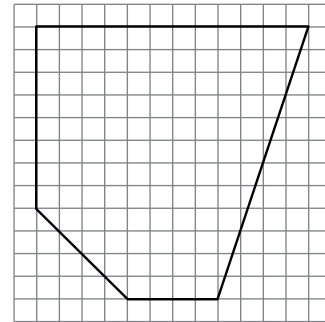
(b)



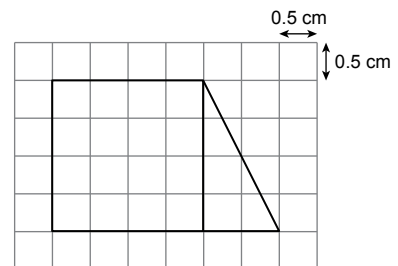
(c)



(d)

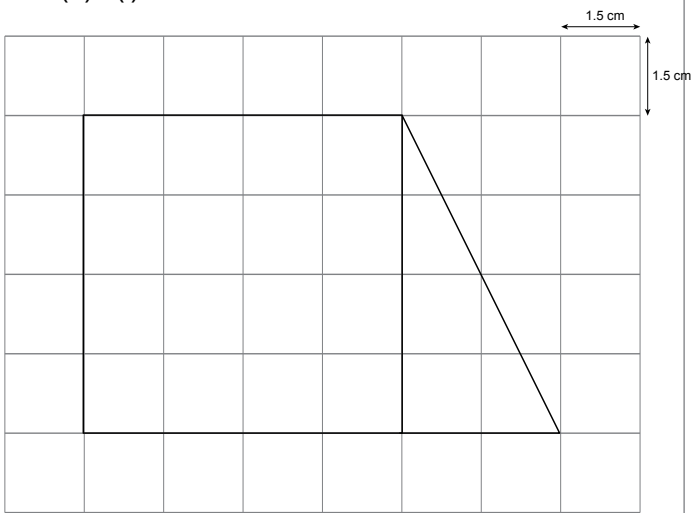


9. (a) (i)



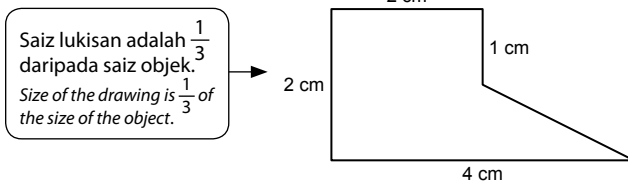
(ii) Skala yang digunakan/ Scale used
 $= 0.5\text{ cm} : 1\text{ cm}$
 $= \frac{1}{2} : 1$
 $= 1 : 2$

(b) (i)

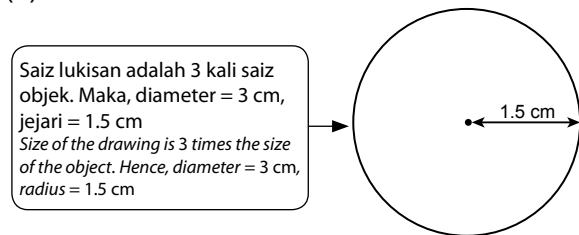


(ii) Skala yang digunakan/ Scale used
 = 1.5 cm : 1 cm
 = $\frac{3}{2}$: 1
 = 1 : $\frac{2}{3}$

10. (a)



(b)



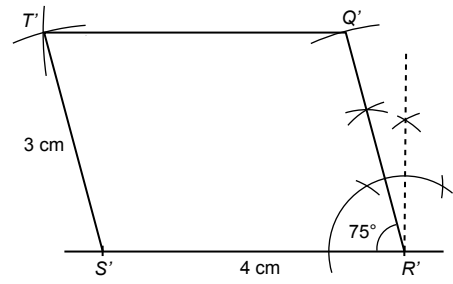
(c) $\frac{1}{2} = \frac{T'S'}{6 \text{ cm}}$

$\frac{1}{2} = \frac{T'S'}{6 \text{ cm}}$

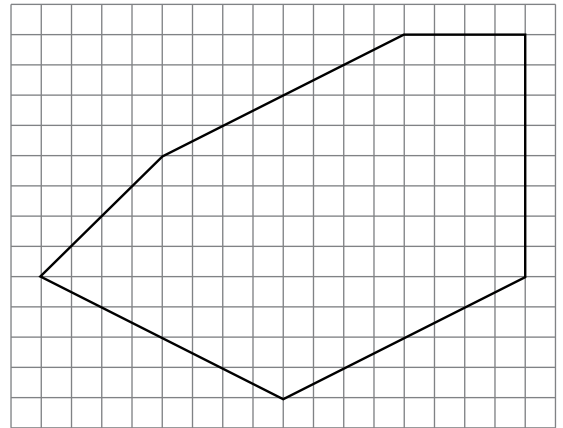
$T'S' = \frac{1}{2} \times 6$
 = 3 cm

$\frac{1}{2} = \frac{S'R'}{8 \text{ cm}}$

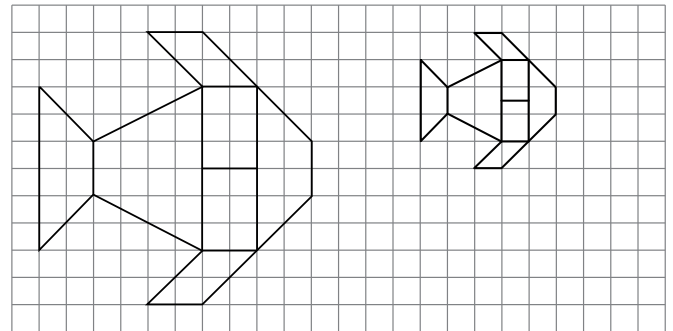
$S'R' = \frac{1}{2} \times 8$
 = 4 cm



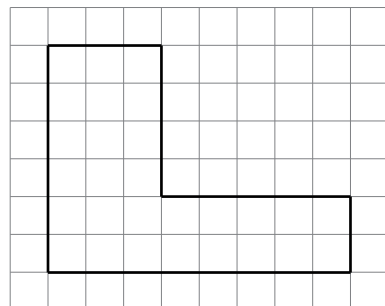
11. (a)



(b)



(c)



13. (a) $\frac{1}{3\,000\,000} = \frac{20 \text{ cm}}{\text{Jarak sebenar}}$
 Jarak sebenar = $3\,000\,000 \times 20$
 = 60 000 000 cm
 = 600 km

$\left[\frac{1}{3\,000\,000} = \frac{20 \text{ cm}}{\text{Actual distance}} \right]$
 Actual distance = $3\,000\,000 \times 20$
 = 60 000 000 cm
 = 600 km

(b) Panjang sisi PQRS = $\sqrt{36} = 6$ cm
Side length of PQRS

Panjang sisi ABCD = $\sqrt{81} = 9$ cm
Side length of ABCD

Skala = 6 : 9
Scale
 = 1 : $\frac{3}{2}$

(c) 2.5 cm dalam pelan mewakili 150 000 cm.
2.5 cm in the plan represents 150 000 cm.

4.6 cm dalam pelan mewakili
4.6 cm in the plan represents

$$\frac{4.6 \times 150\,000}{2.5}$$

= 276 000 cm

Maka, panjang sebenar lebuh raya PQ ialah 2.76 km.

Hence, the actual length of the highway PQ is 2.76 km.

(d) (i) $\frac{\text{Tinggi model}}{35 \text{ m}} = \frac{1}{500}$
 Tinggi model = $\frac{35 \times 1}{500}$
 = 0.07 m
 = 7 cm

$$\left[\begin{array}{l} \frac{\text{Height of model}}{35 \text{ m}} = \frac{1}{500} \\ \text{Height of model} = \frac{35 \times 1}{500} \\ \phantom{\text{Height of model}} = 0.07 \text{ m} \\ \phantom{\text{Height of model}} = 7 \text{ cm} \end{array} \right]$$

(ii) $\frac{20 \text{ cm}}{\text{Panjang sebenar}} = \frac{1}{500}$
 Panjang sebenar = 20×500
 = 10 000 cm
 = 100 m

$$\left[\begin{array}{l} \frac{20 \text{ cm}}{\text{Actual length}} = \frac{1}{500} \\ \text{Actual length} = 20 \times 500 \\ \phantom{\text{Actual length}} = 10\,000 \text{ cm} \\ \phantom{\text{Actual length}} = 100 \text{ m} \end{array} \right]$$

(e) $\frac{\text{Panjang lukisan}}{30.5 \text{ m}} = \frac{1}{300}$
 Panjang lukisan = $\frac{30.5 \times 1}{300}$
 = 0.102 m
 = 10.2 cm

$$\left[\begin{array}{l} \frac{\text{Drawing's length}}{30.5 \text{ m}} = \frac{1}{300} \\ \text{Drawing's length} = \frac{30.5 \times 1}{300} \\ \phantom{\text{Drawing's length}} = 0.102 \text{ m} \\ \phantom{\text{Drawing's length}} = 10.2 \text{ cm} \end{array} \right]$$

Lebar lukisan = $\frac{1}{15.25 \text{ m}} = \frac{1}{300}$
 Lebar lukisan = $\frac{15.25 \times 1}{300}$
 = 0.051 m
 = 5.1 cm

Luas lukisan = Panjang \times Lebar
Area of drawing = Length \times Width
 = 10.2 \times 5.1
 = 52.02 cm²

$$\left[\begin{array}{l} \frac{\text{Drawing's width}}{15.25 \text{ m}} = \frac{1}{300} \\ \text{Drawing's width} = \frac{15.25 \times 1}{300} \\ \phantom{\text{Drawing's width}} = 0.051 \text{ m} \\ \phantom{\text{Drawing's width}} = 5.1 \text{ cm} \end{array} \right]$$

(f) $1 : \frac{1}{4}$ bermaksud lukisan berskala adalah empat kali objek.

$1 : \frac{1}{4}$ means the scale drawing is four times the object.

Panjang tapak lukisan
Length of the drawing's base
 = 4 \times 24
 = 96 cm

Tinggi lukisan
Height of the drawing
 = 4 \times 9
 = 36 cm

Luas lukisan berskala bagi segi tiga itu
Area of the scale drawing of the triangle

$$= \frac{1}{2} \times 96 \times 36$$

= 1 728 cm²

(g) (i) Skala / Scale = 4 cm : 2 cm
 $= 1 : \frac{1}{2}$

Lukisan berskala itu adalah dua kali objeknya. Maka,
The scale drawing is twice its object. Hence,

$$\begin{aligned} 2 \times x &= 8 & x + y &= 2 \times 7 & 2 \times z &= 10 \\ x &= 4 & 4 + y &= 14 & z &= 5 \\ & & y &= 10 & & \end{aligned}$$

(ii) Isi padu / Volume = $\frac{1}{2} \times (4 + 7) \times 2 \times 5$
 $= 55 \text{ cm}^3$

Power PT3

Bahagian A

1. $\frac{1}{2} = \frac{P'Q'}{2}$, $\frac{1}{2} = \frac{Q'R'}{3}$
 $P'Q' = 1 \text{ cm}$ $Q'R' = 1.5 \text{ cm}$
 Jawapan/ Answer: **B**

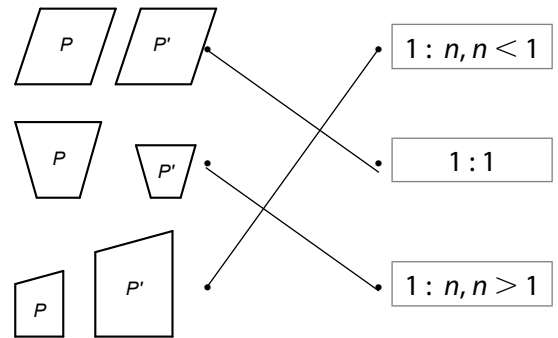
2. Segi empat tepat C bukan lukisan berskala bagi segi empat tepat P.
Rectangle C is not the scale drawing of rectangle P.
 Jawapan/ Answer: **C**

3. Skala yang digunakan / Scale used
 $= 10.5 : 3.5$
 $= 1 : \frac{3.5}{10.5}$
 $= 1 : \frac{1}{3}$
 Jawapan/ Answer: **A**

4. Lukisan berskala dan objek adalah sama saiz.
The scale drawing and the object are of equal size.
 Luas lukisan berskala / Area of the scale drawing
 $= 4 \times 4$
 $= 16 \text{ cm}^2$
 Jawapan/ Answer: **D**

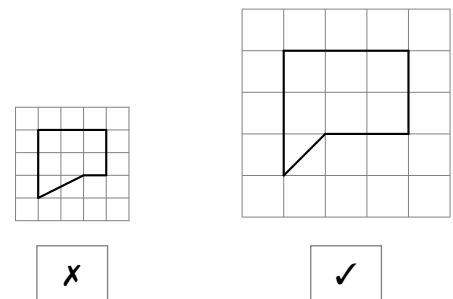
Bahagian B

5. (a)



(b) Skala / Scale = 0.3 : 0.5 = $1 : \frac{5}{3}$

6. (a)



(b) 6 cm mewakili / represents 12 km
 1 cm mewakili / represents = 2 km
 4 cm mewakili / represents = 8 km
 Jarak sebenar QR ialah 8 km.
Actual distance of QR is 8 km.

7. (a) Skala / Scale = 4.5 : 27
 $= 1 : 6$

(b) (i) Jarak sebenar / Actual distance
 $= 12 \times 200\,000$
 $= 2\,400\,000 \text{ cm}$
 $= 24 \text{ km}$

(ii) Jarak pada peta / Distance on the map
 $= \frac{1\,800\,000}{200\,000}$
 $= 9 \text{ cm}$

(c) Panjang foto / Length of the photo
 $= 25 - 3 - 3$
 $= 19 \text{ cm}$
 Lebar foto / Breadth of the photo
 $= 18 - 2.5 - 2.5$
 $= 13 \text{ cm}$

Panjang lukisan berskala
Length of the scale drawing

$$= \frac{19}{\frac{1}{4}}$$

$$= 76 \text{ cm}$$

Lebar lukisan berskala
Breadth of the scale drawing

$$= \frac{13}{\frac{1}{4}}$$

$$= 52 \text{ cm}$$

8. (a) (i) Skala/ Scale = 40 cm : 20 cm

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

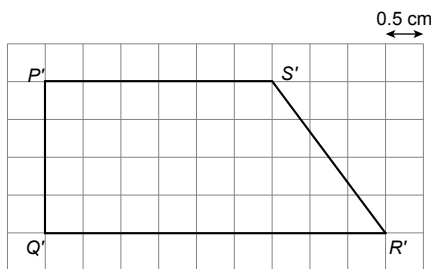
(ii) $PR = \sqrt{20^2 + 21^2}$

$$= 29 \text{ cm}$$

$$SU = \frac{29}{\frac{1}{2}}$$

$$= 58 \text{ cm}$$

(b)



(c) $\frac{1}{5} = \frac{4.5}{PQ}$ $\frac{1}{5} = \frac{3}{t}$

$$PQ = 22.5$$

$$t = 15$$

Luas segi tiga PQR/ Area of triangle PQR

$$= \frac{1}{2} \times 22.5 \times 15$$

$$= 168.75 \text{ cm}^2$$

Bahagian C

9. (a) $1 : \frac{1}{3}$ bermaksud lukisan berskala adalah tiga kali objek.
 $1 : \frac{1}{3}$ means the scale drawing is three times the object.

Panjang AB pada lukisan

Length of AB on the drawing

$$= 3 \times 5$$

$$= 15 \text{ cm}$$

Panjang BC pada lukisan

Length of BC on the drawing

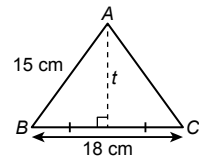
$$= 3 \times 6$$

$$= 18 \text{ cm}$$

$$t = \sqrt{15^2 - 9^2}$$

$$= \sqrt{144}$$

$$= 12 \text{ cm}$$



Luas segi tiga pada lukisan

Area of the triangle in the drawing

$$= \frac{1}{2} \times 18 \times 12$$

$$= 108 \text{ cm}^2$$

- (b) $1 : 150$ bermaksud 1 cm pada pelan mewakili 150 cm pada lantai
 $1 : 150$ means 1 cm on the plan representing 150 cm on the floor

Panjang sebenar

Actual length

$$= 2.4 \times 150$$

$$= 360 \text{ cm}$$

$$= 3.6 \text{ m}$$

Lebar sebenar

Actual width

$$= 1.6 \times 150$$

$$= 240 \text{ cm}$$

$$= 2.4 \text{ m}$$

Luas sebenar bilik A

Actual area of room A

$$= 3.6 \times 2.4$$

$$= 8.64 \text{ m}^2$$

(c) (i)
$$\frac{10 \text{ cm}}{\text{Jarak sebenar / Actual distance}} = \frac{1}{80\,000}$$

$$\text{Jarak sebenar / Actual distance}$$

$$= 80\,000 \times 10$$

$$= 800\,000 \text{ cm}$$

$$= 8 \text{ km}$$

(ii) Masa yang diambil / Time taken
 $= 8 \times 30$
 $= 240 \text{ minit / 240 minutes}$
 $= 4 \text{ jam / 4 hours}$

Maka, Akmal akan sampai ke stesen Y pada pukul 11:00 a.m.
 Hence, Akmal will reach the station Y at 11:00 a.m.

Power KBAT

1.
$$\frac{1}{5\,000} = \frac{\text{Ukuran lukisan berskal / Scale drawing's measurement}}{\text{Ukuran objek / Object's measurement}}$$

Maka, ukuran sebenar

Hence, the actual measurement of

$$PS = 5\,000 \times 4 = 20\,000 \text{ cm} = 200 \text{ m}$$

$$PQ = 5\,000 \times 1.68 = 8\,400 \text{ cm} = 84 \text{ m}$$

$$SV = 5\,000 \times 1.5 = 7\,500 \text{ cm} = 75 \text{ m}$$

(a) 1 minit 29 saat = 60 saat + 29 saat = 89 saat
 1 minute 29 seconds = 60 seconds + 29 seconds
 $= 89 \text{ seconds}$

Jarak dari W ke V / Distance from W to V

$$= \sqrt{WS^2 + SV^2}$$

$$= \sqrt{100^2 + 75^2} \leftarrow \begin{matrix} WS = 200 \div 2 \\ = 100 \text{ m} \end{matrix}$$

$$= 125 \text{ m}$$

Laju / Speed = $\frac{\text{Jarak / Distance}}{\text{Masa / Time}}$

$$= \frac{125}{89}$$

$$= 1.4 \text{ m s}^{-1}$$

(b) Panjang pagar / Length of fence
 $= \text{perimeter } QTU + \text{perimeter } VSW$
 $= QT + QU + UT + WS + SV + WV$
 $= 42 + 42 + \left(\frac{90}{360} \times 2 \times \frac{22}{7} \times 42 \right) +$
 $100 + 75 + 125 \leftarrow QT = 84 \div 2 = 42 \text{ m}$
 $= 42 + 42 + 66 + 100 + 75 + 125$
 $= 450 \text{ m}$