Scale Maths - Worksheet

Skill

Group A - Map scales (actual distance)

Use the map scale for each question to calculate the actual distance:

1) A map scale is given as 1cm:1km. Calculate the actual distance that represents 4cm on the map.

2) A map scale is given as 1cm:2km. Calculate the actual distance that represents 7cm on the map.

3) A map scale is given as 1cm:5km. Calculate the actual distance that represents 9cm on the map.

4) A map scale is given as 1cm:3km. Calculate the actual distance that represents 12.8cm on the map.

5) A map scale is given as 2cm:1km. Calculate the actual distance that represents 6cm on the map.

6) A map scale is given as 4cm:1km. Calculate the actual distance that represents 14cm on the map.

7) A map scale is given as 1:100000. Calculate the actual distance that represents 4cm on the map in kilometres.

8) A map scale is given as 1:50000. Calculate the actual distance that represents 9cm on the map in kilometres.

9) A map scale is given as 1:25000. Calculate the actual distance that represents 6.1cm on the map in kilometres.

10) A map scale is given as 1:120000. Calculate the actual distance that represents 3.5cm on the map in kilometres.

11) A map scale is given as 1:150000. Calculate the actual distance that represents 0.8cm on the map in kilometres.

12) A map scale is given as $1{:}1\times 10^{8}$. Calculate the actual distance that represents 6.2cm on the map in kilometres.

Group B - Map scales (distance on the map)

Use the map scale for each question to calculate the distance on the map:

1) A map scale is given as 1cm:1km. Calculate the distance on the map that represents 5km.

2) A map scale is given as 1cm:4km. Calculate the distance on the map that represents 10km.

3) A map scale is given as 1cm:3km. Calculate the distance on the map that represents 14km.

4) A map scale is given as 1cm:4km. Calculate the distance on the map that represents 12.6km.

5) A map scale is given as 3cm:1km. Calculate the distance on the map that represents 15.3km.

6) A map scale is given as 5cm:2km. Calculate the distance on the map that represents 10km.

Scale Maths - Worksheet

7) A map scale is given as 1:100000. Calculate the distance on the map that represents 8km.

8) A map scale is given as 1:50000. Calculate the distance on the map that represents 5.8km.

9) A map scale is given as 1:20000. Calculate the distance on the map that represents 82km.

10) A map scale is given as 1:150000. Calculate the distance on the map that represents 1.2km.

11) A map scale is given as 1:200000. Calculate the distance on the map that represents 135km.

12) A map scale is given as $1{:}1\times 10^{7}$. Calculate the distance on the map that represents 250km.

Group C - Map scales (calculate the scale ratio)

Calculate the scale ratio given the distance on the map and the actual distance. Write each ratio in the specified format:

1) The distance between two points on a map is 4cm. The actual distance is 4km. Express the scale of the map in its simplest form.

2) The distance between two points on a map is 12cm. The actual distance is 8km. Express the scale of the map in its simplest form.

3) The distance between two points on a map is 15.6cm. The actual distance is 8km. Express the scale of the map in its simplest form.

4) The distance between two points on a map is 12.5cm. The actual distance is 16.8km. Express the scale of the map in its simplest form.

5) The distance between two points on a map is 2.1cm. The actual distance is 7km. Express the scale of the map in the form $1cm{:}\ n\ km$.

6) The distance between two points on a map is 5.8cm. The actual distance is 9km. Express the scale of the map in its simplest form.

7) The distance between two points on a map is 11.5cm. The actual distance is 5km. Express the scale of the map in the form $1cm{:}\ n\ km$.

8) The distance between two points on a map is 2.7cm. The actual distance is 15.12km. Express the scale of the map in the form $1cm{:}\ n\ km$.

9) The distance between two points on a map is 5cm. The actual distance is 12km. Express the scale of the map in the form $1cm{:}\ n\ cm$.

10) The distance between two points on a map is 8cm. The actual distance is 2.5km. Express the scale of the map in the form $1cm{:}\ n\ cm$.

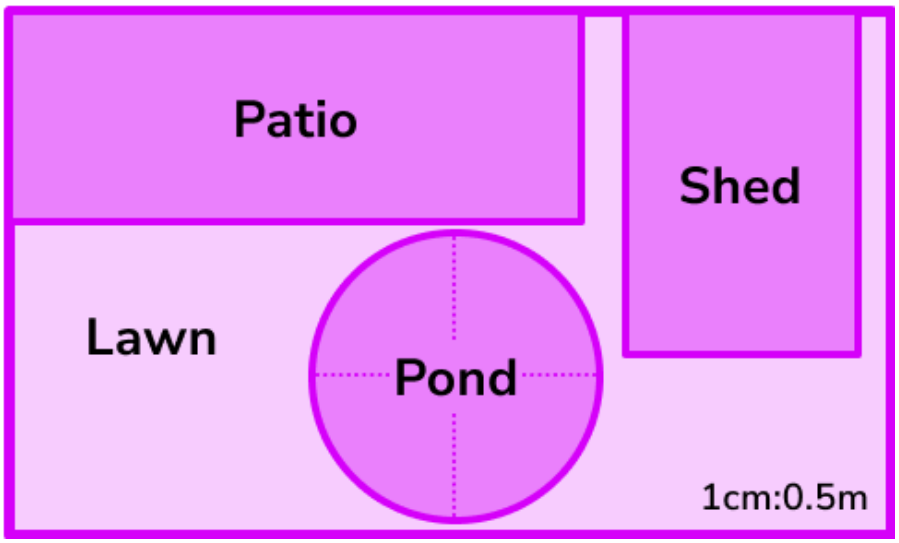
11) The distance between two points on a map is 6.8cm. The actual distance is 3.4km. Express the scale of the map in the form $1cm{:}\ n\ cm$.

12) The distance between two points on a map is 19.2cm. The actual distance is 4.8km. Express the scale of the map in the form $1cm{:}\ n\ cm$.

Scale Maths - Worksheet

Applied

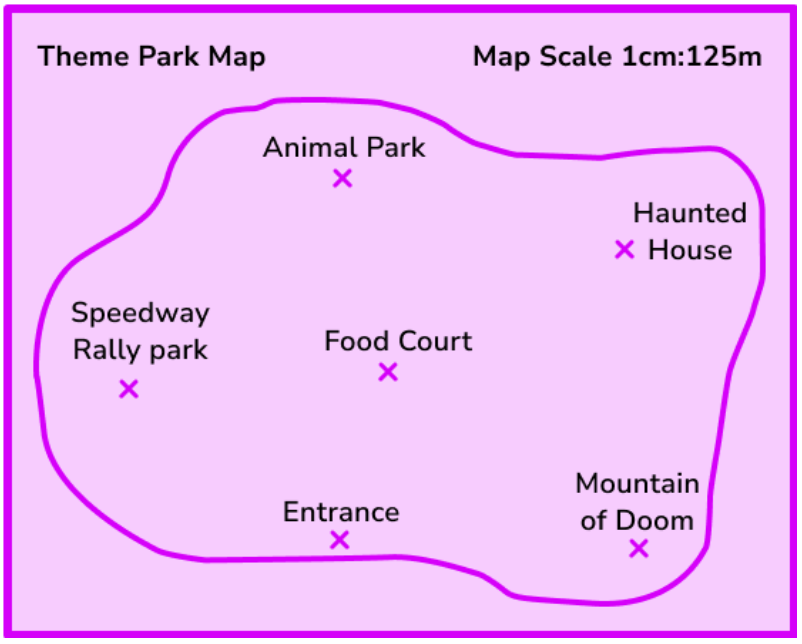
1) The scale diagram below shows the plan of a garden.



(a) Calculate the actual dimensions of the Shed.

(b) Calculate the area of the Pond.

2) The scale diagram below shows the map of a theme park.



(a) Find the actual distance between the Haunted House and the Mountain of Doom roller coaster.

(b) Find the actual distance between the Animal Park and the Entrance.

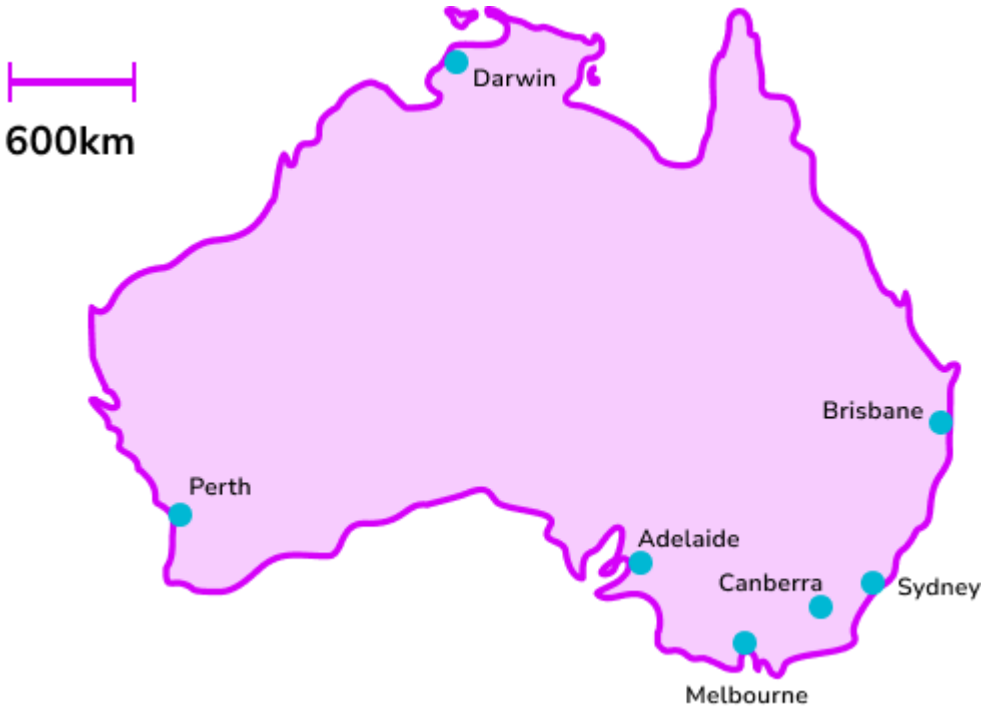
Scale Maths - Worksheet

3) A toy maker is constructing a scale model of a house. The doll's house to the actual dimensions is made to a scale of 1:50. Calculate the dimensions of the following items within the doll's house, given their actual dimensions.

(a) The table is 2.4 metres long, 1.8 metres wide, and 1.1 metres tall. Calculate the dimensions in centimetres.

(b) The teapot is 22cm tall, 19cm wide, and 24.5cm long. Calculate the dimensions in millimetres.

4) Below is a scale diagram of mainland Australia.



(a) Use the scale to determine the actual distance between Darwin and Brisbane.

(b) Lake Torrens is located at the point of intersection between Perth and Brisbane, and Darwin and Adelaide. How far is Lake Torrens from Sydney in kilometres.

Scale Maths - Exam Questions

1) **(a)** The diagram below shows a man standing next to a tree. Given that the man is 2m tall, estimate the height of the tree.

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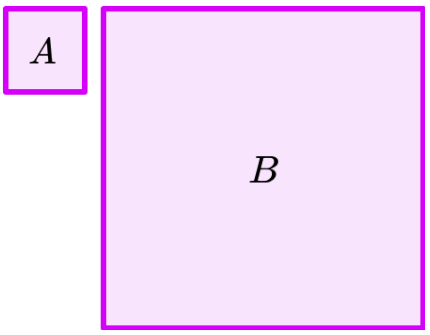
(3)

(b) Square A has an area of $4cm^2$. Estimate the area of square B.



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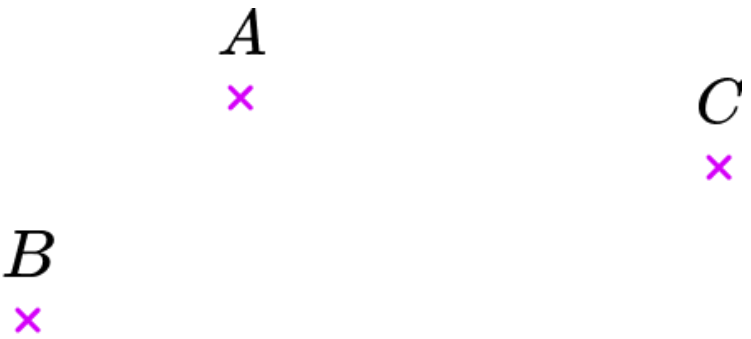
(4)

(8 marks)

Scale Maths - Exam Questions

2) **(a)** Three radio masts are located at points A, B, and C. Given that the actual distance between masts A and B is 16.8km, calculate the scale of the diagram to the actual distance.



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(2)

(b) What is the actual distance of mast C from mast B?

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(2)

(4 marks)

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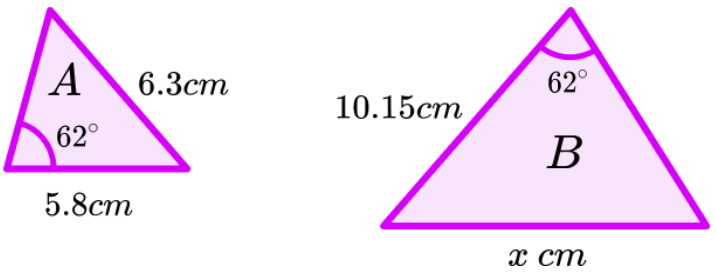
3) **(a)** The two triangles below are similar. Calculate the value of x.



.....

(3)

Scale Maths - Exam Questions

(b) What is the scale ratio of Triangle B to Triangle A in its simplest form.

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(2)

(5 marks)

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4) **(a)** The distance on a map with the scale 1:50,000 is $x$cm. What is the length of the same route on a map with a scale of 1:25,000?
Circle the correct answer.

$2x$	x	$\frac{1}{2}x$	$50000x$

(1)

(b) Ollie is answering the question:

> The distance between two points on a map is 123 kilometres. Given that the ratio on the map is 1:120000, calculate the distance on the map. State the units of your answer.

Below is his solution.

$$120,000 \div 123 =$$

$$= 975.61cm\ (2dp)$$

Is Ollie correct? Explain your answer.

.....

(4)

(8 marks)

Scale Maths - Answers

	Question	Answer
	Skill Questions	
Group A	Use the map scale for each question to calculate the actual distance.	
	1) A map scale is given as 1cm:1km. Calculate the actual distance that represents 4cm on the map.	**1)** $1 \times 4 = 4km$
	2) A map scale is given as 1cm:2km. Calculate the actual distance that represents 7cm on the map.	**2)** $2 \times 7 = 14km$
	3) A map scale is given as 1cm:5km. Calculate the actual distance that represents 9cm on the map.	**3)** $5 \times 9 = 45km$
	4) A map scale is given as 1cm:3km. Calculate the actual distance that represents 12.8cm on the map.	**4)** $3 \times 12.8 = 38.4km$
	5) A map scale is given as 2cm:1km. Calculate the actual distance that represents 6cm on the map.	**5)** $2:1 = 1:\frac{1}{2}$ $6 \times \frac{1}{2} = 3km$
	6) A map scale is given as 4cm:1km. Calculate the actual distance that represents 14cm on the map.	**6)** $14 \div 4 = 3.5$ $3.5 \times 1 = 3.5km$
	7) A map scale is given as 1:100000. Calculate the actual distance that represents 4cm on the map in kilometres.	**7)** $100000 \div 100000 = 1$ $4 \times 1 = 4km$
	8) A map scale is given as 1:50000. Calculate the actual distance that represents 9cm on the map in kilometres.	**8)** $50000 \div 100000 = \frac{1}{2}$ $1:\frac{1}{2}$ $9 \times \frac{1}{2} = 4.5km$
	9) A map scale is given as 1:25000. Calculate the actual distance that represents 6.1cm on the map in kilometres.	**9)** $25000 \div 100000 = \frac{1}{4}$ $1:\frac{1}{4}$ $6.1 \times \frac{1}{4} = 1.525km$

Scale Maths - Answers

Group A contd	**10)** A map scale is given as 1:120000. Calculate the actual distance that represents 3.5cm on the map in kilometres.	**10)** $120000 \div 100000 = 1.2$ $3.5 \times 1.2 = 4.2km$
	11) A map scale is given as 1:150000. Calculate the actual distance that represents 0.8cm on the map in kilometres.	**11)** $150000 \div 100000 = 1.5$ $1 : 1.5$ $0.8 \times 1.5 = 1.2km$
	12) A map scale is given as $1:1 \times 10^8$. Calculate the actual distance that represents 6.2cm on the map in kilometres.	**12)** $1 \times 10^8 \div 100000 = 100$ $6.2 \times 100 = 620km$
Group B	Use the map scale for each question to calculate the distance on the map.	
	1) A map scale is given as 1cm:1km. Calculate the distance on the map that represents 5km.	**1)** $5 \div 1 = 5cm$
	2) A map scale is given as 1cm:4km. Calculate the distance on the map that represents 10km.	**2)** $10 \div 4 = 2.5cm$
	3) A map scale is given as 1cm:3km. Calculate the distance on the map that represents 14km.	**3)** $14 \div 3 = 4.67cm$
	4) A map scale is given as 1cm:4km. Calculate the distance on the map that represents 12.6km.	**4)** $12.6 \div 4 = 3.15cm$
	5) A map scale is given as 3cm:1km. Calculate the distance on the map that represents 15.3km.	**5)** $15.3 \times 3 = 45.9cm$
	6) A map scale is given as 5cm:2km. Calculate the distance on the map that represents 10km.	**6)** $10 \div 2 = 5$ $5 \times 5 = 25cm$
	7) A map scale is given as 1:100000. Calculate the distance on the map that represents 8km.	**7)** $100000 \div 100000 = 1$ $1cm : 1km$ $8 \div 1 = 8cm$

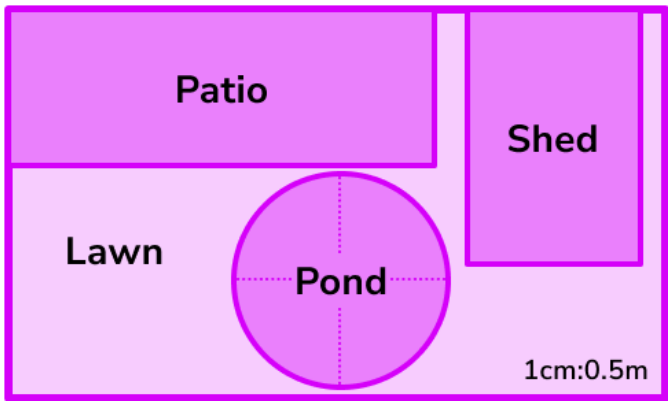
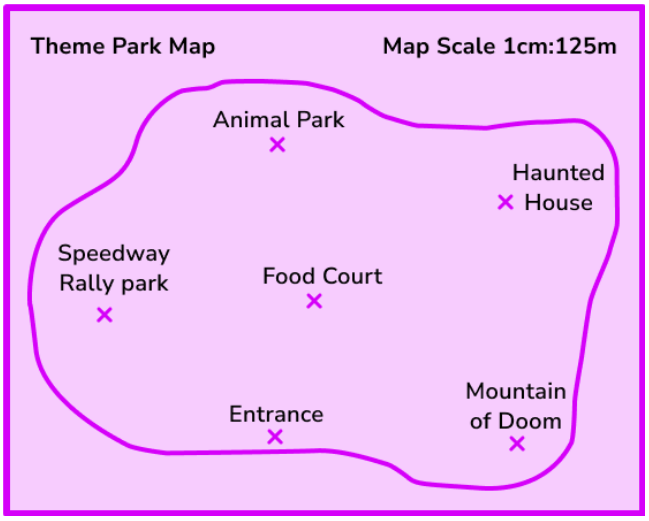
Scale Maths - Answers

Group B contd	**8)** A map scale is given as 1:50000. Calculate the distance on the map that represents 5.8km.	**8)** $50000 \div 100000 = \frac{1}{2}$ $1cm: \frac{1}{2}km$ $5.8 \div \frac{1}{2} = 11.6cm$
	9) A map scale is given as 1:20000. Calculate the distance on the map that represents 82km.	**9)** $20000 \div 100000 = 0.2$ $1cm: 0.2km$ $82 \div 0.2 = 410cm$
	10) A map scale is given as 1:150000. Calculate the distance on the map that represents 1.2km.	**10)** $150000 \div 100000 = 1.5$ $1cm: 1.5km$ $1.2 \div 1.5 = 0.8cm$
	11) A map scale is given as 1:200000. Calculate the distance on the map that represents 135km.	**11)** $200000 \div 100000 = 2$ $1cm: 2km$ $135 \div 2 = 67.5cm$
	12) A map scale is given as $1:1 \times 10^7$. Calculate the distance on the map that represents 250km.	**12)** $1 \times 10^7 \div 100000 = 100$ $1cm: 100km$ $250 \div 100 = 2.5cm$
Group C	Calculate the scale ratio given the distance on the map and the actual distance. Write each ratio in the specified format.	
	1) The distance between two points on a map is 4cm. The actual distance is 4km. Express the scale of the map in its simplest form.	**1)** $4cm: 4km$ $1cm: 1km$
	2) The distance between two points on a map is 12cm. The actual distance is 8km. Express the scale of the map in its simplest form.	**2)** $12cm: 8km$ $3cm: 2km$
	3) The distance between two points on a map is 15.6cm. The actual distance is 8km. Express the scale of the map in its simplest form.	**3)** $15.6cm: 8km$ $156cm: 80km$ $39cm: 20km$
	4) The distance between two points on a map is 12.5cm. The actual distance is 16.8km. Express the scale of the map in its simplest form.	**4)** $12.5cm: 16.8km$ $125cm: 168km$

Scale Maths - Answers

Group C contd	**5)**	The distance between two points on a map is 2.1cm. The actual distance is 7km. Express the scale of the map in the form $1cm: n\ km$.	**5)** $2.1cm: 7km$ $1cm: 3.\dot{3}km$
	6)	The distance between two points on a map is 5.8cm. The actual distance is 9km. Express the scale of the map in its simplest form.	**6)** $5.8cm: 9km$ $58cm: 90km$ $29cm: 45km$
	7)	The distance between two points on a map is 11.5cm. The actual distance is 5km. Express the scale of the map in the form $1cm: n\ km$.	**7)** $11.5cm: 5km$ $1cm: \frac{10}{23}km$
	8)	The distance between two points on a map is 2.7cm. The actual distance is 15.12km. Express the scale of the map in the form $1cm: n\ km$.	**8)** $2.7cm: 15.12km$ $270cm: 1512km$ $1cm: 5.6km$
	9)	The distance between two points on a map is 5cm. The actual distance is 12km. Express the scale of the map in the form $1cm: n\ cm$.	**9)** $5cm: 12km$ $1cm: 2.4km$ $1cm: 240000\ cm$
	10)	The distance between two points on a map is 8cm. The actual distance is 2.5km. Express the scale of the map in the form $1cm: n\ cm$.	**10)** $8cm: 2.5km$ $80cm: 25km$ $1cm: 0.3125km$ $1cm: 31250cm$
	11)	The distance between two points on a map is 6.8cm. The actual distance is 3.4km. Express the scale of the map in the form $1cm: n\ cm$.	**11)** $6.8cm: 3.4km$ $68cm: 34km$ $1cm: 0.5km$ $1cm: 50000\ cm$
	12)	The distance between two points on a map is 19.2cm. The actual distance is 4.8km. Express the scale of the map in the form $1cm: n\ cm$.	**12)** $19.2cm: 4.8km$ $192cm: 48km$ $1cm: 0.25km$ $1cm: 25000\ cm$

Scale Maths - Answers

	Question	Answer
	Applied Questions	
1)	The scale diagram below shows the plan of a garden.  **a)** Calculate the actual dimensions of the Shed. **b)** Calculate the area of the Pond.	**a)** $4.5cm \times 0.5 = 2.25m$ $3.1cm \times 0.5 = 1.55m$ **b)** Radius = $(3.85 \times 0.5) \div 2 = 0.9625$ $\pi \times 0.9625^2 = 2.91m^2\ (2dp)$
2)	The scale diagram below shows the map of a theme park.  **a)** Find the actual distance between the Haunted House and the Mountain of Doom roller coaster. **b)** Find the actual distance between the Animal Park and the Entrance.	**a)** $3.9cm$ $3.9 \times 125 = 487.5m$ **b)** $4.75cm$ $4.75 \times 125 = 593.75m$

Scale Maths - Answers

3) A toy maker is constructing a scale model of a house. The doll's house to the actual dimensions is made to a scale of 1:50. Calculate the dimensions of the following items within the doll's house, given their actual dimensions.

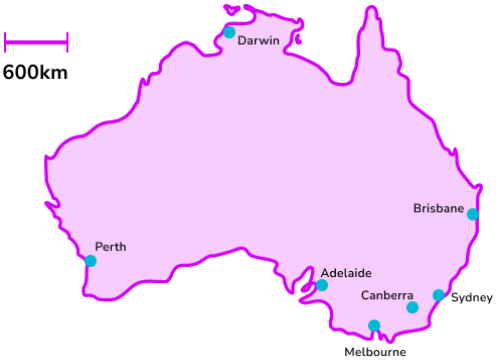
a) The table is 2.4 metres long, 1.8 metres wide, and 1.1 metres tall. Calculate the dimensions in centimetres.

a)
$2.4 \times 50 = 0.048m$
$0.048 \times 100 = 4.8cm\ long$
$1.8 \div 50 \times 100 = 3.6cm\ wide$
$1.1 \div 50 \times 100 = 2.2cm\ tall$

b) The teapot is 22cm tall, 19cm wide, and 24.5cm long. Calculate the dimensions in millimetres.

b)
$22 \div 50 \times 10 = 4.4mm\ tall$
$19 \div 50 \times 10 = 3.8mm\ wide$
$24.5 \div 50 \times 10 = 4.9mm\ long$

4) Below is a scale diagram of mainland Australia.

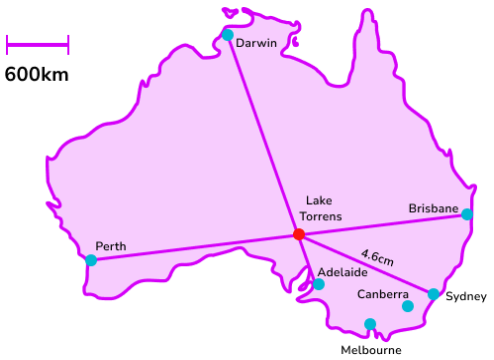


a) Use the scale to determine the actual distance between Darwin and Brisbane.

a)
$7.9cm$
$1.65cm: 600km$
$1cm: 363.\dot{6}\dot{3}km$
$7.9 \times 363.\dot{6}\dot{3} = 2872.\dot{7}\dot{2}km$

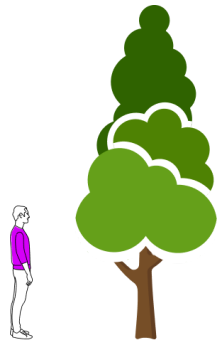
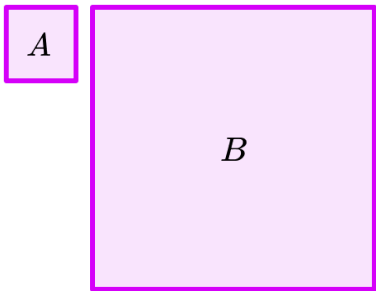
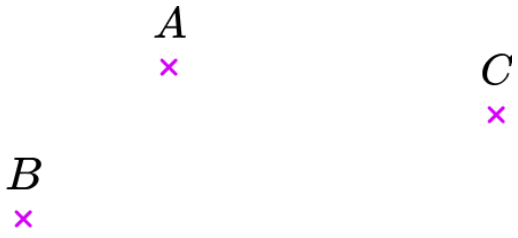
b) Lake Torrens is located at the point of intersection between Perth and Brisbane, and Darwin and Adelaide. How far is Lake Torrens from Sydney in kilometres.

b)

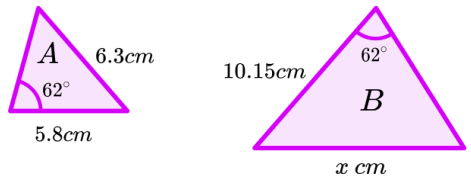


$3.9cm$
$3.9 \div 1.65 \times 600 = 1418.\dot{1}\dot{8}km$

Scale Maths - Mark Scheme

	Question	Answer	
	Exam Questions		
1) (a)	The diagram below shows a man standing next to a tree. Given that the man is 2m tall, estimate the height of the tree. 	(a) Man = 2.5cm, Tree = 6.4cm ($\pm$ 0.1cm) $6.4 \div 2.5 \times 2$ $5.12m$	**(1)** **(1)** **(1)**
(b)	Square A has an area of $4cm^2$. Estimate the area of square B. 	(b) Square A = 1.1cm ($\pm$ 0.1cm) width **and** Square B = 4.2cm ($\pm$ 0.1cm) width **seen** $'4.2' \div '1.1' = '3.\dot{8}\dot{1}'$ $'3.\dot{8}\dot{1}'^2 = 14.5785124...$ **ft** $4 \times '14.5785...' = 53.314cm^2$ **ft**	**(1)** **(1)** **(1)** **(1)**
2) (a)	Three radio masts are located at points A, B, and C. Given that the actual distance between masts A and B is 16.8km, calculate the scale of the diagram to the actual distance. 	(a) $16.8 \div 4 = 4.2$ $1cm$: $4.2km$	**(1)** **(1)**
(b)	What is the actual distance of mast C from mast B?	(b) $9.35cm \times 4.2$ $39.27km$	**(1)** **(1)**

Scale Maths - Mark Scheme

3) (a)	The two triangles below are similar. Calculate the value of x. 	(a) $10.15 \div 5.8 = 1.75$ 6.3×1.75 $x = 11.025cm$	**(1)** **(1)** **(1)**
(b)	What is the scale ratio of Triangle B to Triangle A?	(b) $1.75 : 1$ $7 : 4$	**(1)** **(1)**
4) (a)	The distance on a map with the scale 1:50,000 is $x$cm. What is the length of the same route on a map with a scale of 1:25,000? $2x$ | x | $\frac{1}{2}x$ | $50000x$	(a) $2x$	**(1)**
(b)	Ollie is answering the question: The distance between two points on a map is 123 kilometres. Given that the ratio on the map is 1:120000, calculate the distance on the map. State the units of your answer. Below is his solution. $120,000 \div 123 =$ $= 975.61cm\ (2dp)$ Is Ollie correct? Explain your answer.	(b) Ollie was wrong **with reason** $120000cm = 1.2km$ $1 : 1.2km$ $123 \div 1.2 = 102.5cm$	**(1)** **(1)** **(1)** **(1)**