GCSE Maths: Scale drawings and maps (Foundation): answers

GCSE Maths - Loci, Bearings and Vectors - Foundation - Lesson 22.1

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at **websink.site/gcse/maths/ch22-constructions-loci-bearings-vectors/foundation/scale-drawings-and-maps/**

Exercise 22A Scale and ratio Non-calculator

1 **Complete each sentence about a scale. Then change the answer to the units shown.**

(a) A scale of 1 : 10 means 1 cm on the drawing is ___ cm in real life.

Answer: 10 cm

(b) A scale of 1 : 100 means 1 cm on the drawing is ___ m in real life.

Answer: 1 m

(c) A scale of 1 : 1000 means 1 cm on the map is ___ m in real life.

Answer: 10 m

(d) A scale of 1 : 100 000 means 1 cm on the map is ___ km in real life.

Answer: 1 km

2 **Write each scale as a ratio in the form 1 : *n*.**

(a) 1 cm represents 5 m

Answer: 1 : 500

(b) 1 cm represents 20 m

Answer: 1 : 2000

(c) 1 cm represents 500 m

Answer: 1 : 50 000

(d) 1 cm represents 2 km

Answer: 1 : 200 000

3 **The scale of a map is shown. Work out the real distance for each map distance.**

(a) Scale 1 : 1000. Map distance 3 cm. Give your answer in metres.

Answer: 30 m

(b) Scale 1 : 5000. Map distance 8 cm. Give your answer in metres.

Answer: 400 m

(c) Scale 1 : 25 000. Map distance 6 cm. Give your answer in kilometres.

Answer: 1.5 km

(d) Scale 1 : 200 000. Map distance 2.5 cm. Give your answer in kilometres.

Answer: 5 km

(e) Scale 1 : 50 000. Map distance 12 cm. Give your answer in kilometres.

Answer: 6 km

(f) Scale 1 : 200. Drawing length 9 cm. Give your answer in metres.

Answer: 18 m

4 **A map has a scale of 1 : 50 000. Two towns are 7.2 cm apart on the map. How far apart are the towns in real life? Give your answer in km.**

Answer: 3.600000000000000008881784197001252323389053344726562 5 km

5 **Work out the length on the map or drawing for each real length.**

(a) Scale 1 : 1000. Real length 50 m.

Answer: 5 cm

(b) Scale 1 : 50 000. Real length 2 km.

Answer: 4 cm

(c) Scale 1 : 250 000. Real length 15 km.

Answer: 6 cm

(d) Scale 1 : 2000. Real length 360 m.

Answer: 18 cm

(e) Scale 1 : 25 000. Real length 4.5 km.

Answer: 18 cm

(f) Scale 1 : 20. Real length 1.8 m.

Answer: 9.000000000000000022204460492503130808472633361816406 25 cm

6 **Work out the scale of each map as a ratio in the form 1 : *n*.**

(a) 4 cm on the map represents 2 km.

Answer: 1 : 50 000

(b) 5 cm on the map represents 250 m.

Answer: 1 : 5000

(c) 2 cm on the map represents 8 km.

Answer: 1 : 400 000

(d) 3 cm on the plan represents 6 m.

Answer: 1 : 200

7 **A toy car is a model of a real car. The scale of the model is 1 : 24. The model is 17.5 cm long. Work out the length of the real car. Give your answer in metres.**

Answer: 4.2 m

8 **A wall is 5.6 m long. It is drawn on a plan with a scale of 1 : 50. How long is the wall on the plan?**

Answer: 11.199999999999999289457264239899814128875732421875 cm

9 **The scale of a map is 1 cm to 250 m.**

(a) Write the scale as a ratio in the form 1 : *n*.

Answer: 1 : 25 000

(b) Two lakes are 7.4 cm apart on the map. How far apart are they in real life? Give your answer in km.

Answer: 1.850000000000000088817841970012523233890533447265625 km

10 **Sam says: "A scale of 1 : 2000 means that 1 cm on the map is 2000 m in real life." Is Sam right? Explain your answer.**

Answer: No. 1 cm is 2000 cm = 20 m.

11 **Map A has a scale of 1 : 25 000. Map B shows the same area with a scale of 1 : 50 000. Which map shows more detail? Give a reason using the distance that 1 cm represents on each map.**

Answer: Map A. 1 cm is 250 m on map A but 500 m on map B.

12 **A walker follows a path that measures 8.4 cm on a map with a scale of 1 : 25 000. She walks at 3 km/h. How many minutes does the walk take?**

Answer: 42 minutes

13 **Show that** **on a map with a scale of 1 : 50 000, a distance of 2 cm on the map is 1 km in real life.**

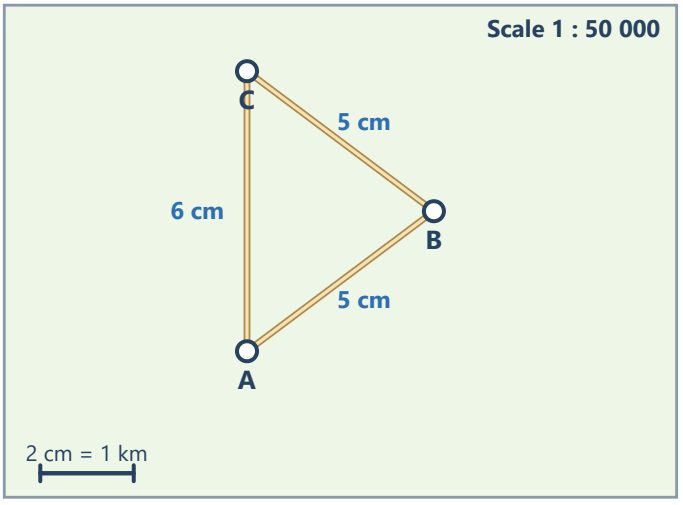
Answer: 2 × 50 000 = 100 000 cm = 1 km

14 **Challenge.** **On a map, 6 cm represents 9 km. A road measures 14.2 cm on the same map. Work out the real length of the road.**

Answer: 21.3 km

Exercise 22B Maps and scale drawings in context Calculator allowed

1 **The map shows three villages A, B and C joined by roads. The scale is 1 : 50 000.**



(a) Work out the real length of the road from A to B.

Answer: 2.5 km

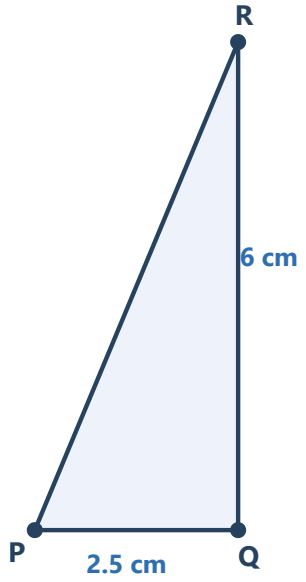
(b) Work out the real length of the road from A to C.

Answer: 3 km

(c) Pat drives from A to C by way of B. How much further is this than driving straight from A to C?

Answer: 2 km

2 **A ladder is 6.5 m long. Its foot is 2.5 m from a vertical wall on flat ground. Make a scale drawing of the right-angled triangle using a scale of 1 cm to 1 m (the triangle in the picture is drawn to this scale). Measure the angle between the ladder and the ground. Give your answer to the nearest degree.**



Answer: 67° (accept 66° to 68°)

3 **The shadow of a flagpole on level ground is 8 m long. The angle of elevation of the Sun is 35°. Use a scale drawing with 1 cm to 1 m to find the height of the flagpole to the nearest metre.**

Answer: 6 m (accept 5 m to 6 m)

4 **A drawing of a footbridge has a scale of 1 : 200. The real bridge is 36 m long. How long is the bridge on the drawing?**

Answer: 18 cm

5 **The scale of a map is 1 : 50 000. Write the scale in the form "1 cm represents ___ km".**

Answer: 0.5 km

6 **A map has a scale of 1 cm to 5 km.**

(a) Write the scale as a ratio in the form 1 : *n*.

Answer: 1 : 500 000

(b) The distance between two cities on the map is 7.4 cm. Work out the real distance.

Answer: 37.000000000000001776356839400250464677810668945312 5 km

7 **On a map with a scale of 1 : 25 000, a school is 4.8 cm east and 3.6 cm north of a railway station. Work out the real distance from the station to the school in a straight line. Give your answer in km.**

Answer: 1.5 km

8 **A cyclist rides along a route that is 15.6 cm long on a map with a scale of 1 : 50 000. She cycles at 12 km/h. How long does the ride take? Give your answer in minutes.**

Answer: 39 minutes

9 **A model of a tower is built to a scale of 1 : 300. The model is 18 cm tall. A window on the model is 0.5 cm tall. Work out the real height of (a) the tower, (b) the window. Give both answers in metres.**

> **Answer:** (a) 54 m, (b) 1.5 m

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