



KS3.M-R6 Scale Drawings and Maps

AQA KS3.M-R6 · Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** State the real distance represented by 1 cm on a map with scale 1:50 000.

(1)

- 2** On a map with scale 1:25 000, what real distance does 4 cm represent? Give your answer in kilometres.

(1)

- 3** A town is 3.2 km from a station in real life. On a map with scale 1:10 000, calculate the map distance in centimetres.

(2)

- 4** A road measures 13 cm on a map and is 6.5 km in reality. Work out the map scale as a ratio in the form 1:n.

(2)

- 5** A path on a map measures 7.4 cm and in real life it is 1.85 km. Find the scale of the map in the form 1:n.

(2)

- 6** On a map with scale 1:40 000 the distance between two villages is 3.6 cm. Calculate the real distance in kilometres.

(2)

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- 7** A map uses the statement 1 cm = 0.5 km. What is the real distance represented by 9 cm on this map? Give your answer in kilometres.

(1)

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- 8** A distance on a map at scale 1:25 000 measures 120 mm. Calculate the real distance in kilometres.

(2)

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- 9** A path is measured on a map as 17.6 cm at a scale of 1:25 000. The student estimates the measurement could be off by plus or minus 0.2 cm. Calculate the possible range of the real distance in kilometres.

(3)

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- 10** A rectangular garden is 12 m by 8 m in reality. Drawn to scale 1:200, what are the lengths of the sides on the drawing in centimetres?

(2)

- 11** On a 1:20 000 map the distance between two shops is 2.75 cm. Give the real distance in metres.

(2)

- 12** Two towns are 18 km apart. On a map with scale 1:90 000 what is the distance between them on the map, in millimetres?

(2)

- 13** A site plan shows 8 cm corresponding to 100 m in reality. Write the scale of the plan in the form 1:n.

(2)

- 14** A hiker will walk 15 km. On a map with scale 1:50 000, how many centimetres long will the route be on the map? If the printed map sheet can show a maximum straight length of 20 cm, how many sheets are needed to show the whole route?

(3)

- 15** A scale drawing uses 1:500. A rectangle on the drawing has area 18 cm^2 . Calculate the real area in square metres.

(3)

- 16** A map shows two landmarks 3.8 cm apart. The scale statement is 1 cm = 750 m. Find the real distance in metres.

(2)

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- 17** A cyclist plans a route that measures 27.5 cm on a map with scale 1:60 000. The cyclist will ride at an average speed of 15 km/h. Estimate the time to complete the route, giving your answer in minutes to the nearest minute.

(4)

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- 18** A school's sports field is a right triangle with legs 90 m and 60 m. A student draws a plan at scale 1:250. Calculate the length of the hypotenuse on the drawing in centimetres, correct to one decimal place.

(4)

Mark scheme · KS3.M-R6 Scale Drawings and Maps

Question 1

- **B1** 500 m or 0.5 km cao
- Answer: **500 m**

Question 2

- **B1** 1 km cao
- Answer: **1 km**

Question 3

- **M1** convert 3.2 km to cm or set up $3.2 \text{ km} = 320000 \text{ cm}$ and divide by 10 000
- **A1** 32 cm cao
- Answer: **32 cm**

Question 4

- **M1** convert 6.5 km to cm = 650 000 cm and form ratio 13:650000 or divide both sides by 13
- **A1** 1:50 000 cao
- Answer: **1:50 000**

Question 5

- **M1** convert 1.85 km to cm = 185 000 cm and divide by 7.4
- **A1** 1:25 000 cao
- Answer: **1:25 000**

Question 6

- **M1** $3.6 \text{ cm} \times 40\,000 = 144\,000 \text{ cm} = 1.44 \text{ km}$
- **A1** 1.44 km cao
- Answer: **1.44 km**

Question 7

- **B1** 4.5 km cao
- Answer: **4.5 km**

Question 8

- **M1** $120 \text{ mm} = 12 \text{ cm}$, then $12 \times 25\,000 = 300\,000 \text{ cm} = 3 \text{ km}$
- **A1** 3 km cao
- Answer: **3 km**

Question 9

- **M1** find minimum map length $17.6 - 0.2 = 17.4 \text{ cm}$ and convert: $17.4 \times 25\,000 = 435\,000 \text{ cm} = 4.35 \text{ km}$
- **M1** find maximum map length $17.6 + 0.2 = 17.8 \text{ cm}$ and convert: $17.8 \times 25\,000 = 445\,000 \text{ cm} = 4.45 \text{ km}$
- **A1** state range 4.35 km to 4.45 km cao
- Answer: **4.35 km to 4.45 km**

Question 10

- **M1** convert metres to cm and divide by 200: $1200/200 = 6$, $800/200 = 4$
- **A1** 6 cm by 4 cm cao
- Answer: **6 cm by 4 cm**

Question 11

- **M1** $2.75 \times 20\,000 = 55\,000 \text{ cm} = 550 \text{ m}$
- **A1** 550 m cao
- Answer: **550 m**

Question 12

- **M1** convert 18 km to cm = 1 800 000 cm then divide by 90 000 = 20 cm
- **A1** 200 mm cao
- **Answer: 200 mm**

Question 13

- **M1** 100 m = 10 000 cm so ratio 8:10000 then divide by 8
- **A1** 1:1250 cao
- **Answer: 1:1250**

Question 14

- **M1** convert 15 km to cm = 1 500 000 cm and divide by 50 000 to get 30 cm
- **M1** compare 30 cm to sheet length 20 cm and compute required number
- **A1** 30 cm; 2 sheets cao
- **Answer: 30 cm and 2 sheets**

Question 15

- **M1** use area scale factor ($500^2 = 250\,000$) and multiply: $18 \times 250\,000 = 4\,500\,000 \text{ cm}^2$
- **M1** convert cm^2 to m^2 : $4\,500\,000 \text{ cm}^2 = 450 \text{ m}^2$
- **A1** 450 m^2 cao
- **Answer: 450 m^2**

Question 16

- **M1** $3.8 \times 750 = 2\,850 \text{ m}$
- **A1** 2850 m cao
- **Answer: 2850 m**

Question 17

- **M1** convert map cm to real: $27.5 \times 60\,000 = 1\,650\,000 \text{ cm} = 16.5 \text{ km}$
- **M1** compute time in hours = $16.5/15 = 1.1 \text{ h}$
- **M1** convert hours to minutes: $1.1 \times 60 = 66 \text{ minutes}$
- **A1** 66 minutes cao
- **Answer: 66 minutes**

Question 18

- **M1** find real hypotenuse: $\sqrt{90^2 + 60^2} = \sqrt{11\,700} = 108.166... \text{ m}$
- **M1** convert to cm: $108.166... \text{ m} = 10\,816.66... \text{ cm}$ then scale by 1/250 giving 43.2666... cm
- **M1** round to one decimal place correctly
- **A1** 43.3 cm cao
- **Answer: 43.3 cm**