3.6 Scale Drawings and Maps: 2-hour Pack

Calculators not allowed · about 120 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A map has a scale of 1 : 1000. A lake is 2.4 cm wide on the map. Work out its real width in metres.

(3)

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2 A map has a scale of 1 : 2000. Two towns are 2.7 cm apart on the map. Work out the real distance between the towns. Give your answer in m.

(2)

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3 A scale drawing uses a scale of 5 cm to 2 m. A wall is 12 cm long on the drawing. Work out the real length of the wall.

(2)

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4 The ratio of the length of a model to the length of the real plane is 5 : 15. Write this ratio in the form 1 : n.

(2)

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5 A scale drawing uses a scale of 5 cm to 10 m. A wall is 18 cm long on the drawing. Work out the real length of the wall.

(2)

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6 A scale drawing uses a scale of 2 cm to 4 m. A wall is 3 cm long on the drawing. Work out the real length of the wall.

(2)

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7 A scale drawing uses a scale of 2 cm to 20 m. A building is 500 m tall. How tall is the building on the drawing?

(2)

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8 A scale drawing uses a scale of 5 cm to 5 m. A building is 50 m tall. How tall is the building on the drawing?

(2)

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9 The ratio of the length of a model to the length of the real plane is 2 : 8. Write this ratio in the form 1 : n.

(2)

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10 A scale drawing uses a scale of 5 cm to 10 m. A wall is 15 cm long on the drawing. Work out the real length of the wall.

(2)

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11 A map has a scale of 1 : 2000. Two towns are 4.1 cm apart on the map. Work out the real distance between the towns. Give your answer in m.

(2)

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12 The ratio of the length of a model to the length of the real plane is 2 : 3. Write this ratio in the form 1 : n.

(2)

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13 Write the ratio 10 : 51 in the form 1 : n.

(2)

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14 The ratio of the length of a model to the length of the real plane is 5 : 23. Write this ratio in the form 1 : n.

(2)

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15 A scale drawing uses a scale of 5 cm to 4 m. A wall is 8 cm long on the drawing. Work out the real length of the wall.

(2)

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16 A scale drawing uses a scale of 2 cm to 4 m. A building is 76 m tall. How tall is the building on the drawing?

(2)

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17 A scale drawing uses a scale of 1 cm to 20 m. A building is 560 m tall. How tall is the building on the drawing?

(2)

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18 The ratio of the length of a model to the length of the real plane is 5 : 13. Write this ratio in the form 1 : n.

(2)

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19 Write the ratio 8 : 47 in the form 1 : n.

(2)

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20 A scale drawing uses a scale of 1 cm to 20 m. A building is 40 m tall. How tall is the building on the drawing?

(2)

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21 The ratio of the length of a model to the length of the real plane is 25 : 130. Write this ratio in the form 1 : n.

(2)

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22 A scale drawing uses a scale of 2 cm to 20 m. A building is 580 m tall. How tall is the building on the drawing?

(2)

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23 A plan of a room uses a scale of 1 : 20. The room is 7.6 m long in real life. How long is the room on the plan? Give your answer in centimetres.

(2)

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24 A scale drawing uses a scale of 1 cm to 5 m. A building is 65 m tall. How tall is the building on the drawing?

(2)

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25 A map has a scale of 1 : 5000. Two towns are 6.7 cm apart on the map. Work out the real distance between the towns. Give your answer in m.

(2)

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26 The ratio of the length of a model to the length of the real plane is 8 : 26. Write this ratio in the form 1 : n.

(2)

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27 Write the ratio 4 : 11 in the form 1 : n.

(2)

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

(2)

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29 A scale drawing uses a scale of 1 cm to 4 m. A building is 108 m tall. How tall is the building on the drawing?

(2)

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30 Write the ratio 5 : 18 in the form 1 : n.

(2)

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31 Write the ratio 10 : 53 in the form 1 : n.

(2)

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32 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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33 The distance between two towns on a map is 6 cm. The scale of the map is 1:200 000. Work out the real distance in kilometres.

(2)

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34 A model of a building is made using a scale of 1:75. The real height of the building is 22.5 m. Work out the height of the model, in centimetres.

(2)

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35 On a map with scale 1:40 000, a lake has a map length of 5.5 cm. Calculate the real length of the lake in kilometres.

(2)

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36 A scale drawing uses 1:250. The length of a room on the drawing is 8.4 cm. Work out the real length of the room, in metres.

(2)

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37 A hiking trail measures 24 cm on a map with scale 1:50 000. The hiker walks at an average speed of 5 km/h. Work out how long the walk will take, giving your answer in hours and minutes.

(3)

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38 A scale drawing of a park uses scale 1:1000. A rectangular field on the drawing measures 6 cm by 4 cm. Work out the real area of the field in square metres.

(3)

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39 Two villages are 8.5 km apart in real life. On a map, the distance between them is drawn as 17 cm. Work out the scale of the map, giving your answer in the form 1:n.

(3)

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40 A map has scale 1:40 000. A cyclist's route measures 18 cm on the map in a straight line, but the actual route follows bends and is 25% longer than this straight-line distance. Work out the real distance the cyclist rides, in kilometres.

(3)

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41 A plan of a car park is drawn to scale 1:500. The car park is rectangular and measures 9 cm by 5 cm on the plan. Local regulations require at least 1 parking space per 12.5 m² of real car park area. Work out the maximum number of parking spaces the car park can have.

(3)

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42 Stretch question. A map is drawn to a scale of 1:25 000. A rectangular nature reserve has a real area of 18 km². Work out the area of the nature reserve on the map, in square centimetres.

(3)

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43 On a map with scale 1:100 000, what real distance does 3 cm represent? Give your answer in kilometres.

(1)

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Mark scheme · 3.6 Scale Drawings and Maps: 2-hour Pack

Question 1

2.4 x 1000	M1
converts cm to m by ÷ 100	M1
24 m cao	A1

Answer: **24 m**

Question 2

2.7 x 2000	M1
54 m cao	A1

Answer: **54 m**

Question 3

12 ÷ 5 x 2 or 12 x 0.4	M1
4.8 m cao	A1

Answer: **4.8 m**

Question 4

15 ÷ 5	M1
1 : 3 cao	A1

Answer: **1 : 3**

Question 5

18 ÷ 5 x 10 or 18 x 2	M1
36 m cao	A1

Answer: **36 m**

Question 6

3 ÷ 2 x 4 or 3 x 2	M1
6 m cao	A1

Answer: **6 m**

Question 7

500 ÷ 20 x 2	M1
50 cm cao	A1

Answer: **50 cm**

Question 8

50 ÷ 5 x 5	M1
50 cm cao	A1

Answer: **50 cm**

Question 9

8 ÷ 2	M1
1 : 4 cao	A1

Answer: **1 : 4**

Question 10

15 ÷ 5 x 10 or 15 x 2	M1
30 m cao	A1

Answer: **30 m**

Question 11

4.1 x 2000	M1
82 m cao	A1

Answer: **82 m**

Question 12

3 ÷ 2	M1
1 : 1.5 cao	A1

Answer: **1 : 1.5**

Question 13

divides both parts by 10	M1
1 : 5.1 cao	A1

Answer: **1 : 5.1**

Question 14

23 ÷ 5	M1
1 : 4.6 cao	A1

Answer: **1 : 4.6**

Question 15

8 ÷ 5 x 4 or 8 x 0.8	M1
6.4 m cao	A1

Answer: **6.4 m**

Question 16

76 ÷ 4 x 2	M1
38 cm cao	A1

Answer: **38 cm**

Question 17

560 ÷ 20 x 1	M1
28 cm cao	A1

Answer: **28 cm**

Question 18

13 ÷ 5	M1
1 : 2.6 cao	A1

Answer: **1 : 2.6**

Question 19

divides both parts by 8	M1
1 : 5.875 cao	A1

Answer: **1 : 5.875**

Question 20

40 ÷ 20 x 1	M1
2 cm cao	A1

Answer: **2 cm**

Question 21

130 ÷ 25	M1
1 : 5.2 cao	A1

Answer: **1 : 5.2**

Question 22

580 ÷ 20 x 2	M1
58 cm cao	A1

Answer: **58 cm**

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Question 23

7.6 x 100 = 760 cm, then ÷ 20	M1
38 cm cao	A1

Answer: **38 cm**

Question 24

65 ÷ 5 x 1	M1
13 cm cao	A1

Answer: **13 cm**

Question 25

6.7 x 5000	M1
335 m cao	A1

Answer: **335 m**

Question 26

26 ÷ 8	M1
1 : 3.25 cao	A1

Answer: **1 : 3.25**

Question 27

divides both parts by 4	M1
1 : 2.75 cao	A1

Answer: **1 : 2.75**

Question 28

120 mm = 12 cm, then 12 x 25 000 = 300 000 cm = 3 km	M1
3 km cao	A1

Answer: **3 km**

Question 29

108 ÷ 4 x 1	M1
27 cm cao	A1

Answer: **27 cm**

Question 30

divides both parts by 5	M1
1 : 3.6 cao	A1

Answer: **1 : 3.6**

Question 31

divides both parts by 10	M1
1 : 5.3 cao	A1

Answer: **1 : 5.3**

Question 32

find minimum map length 17.6 - 0.2 = 17.4 cm and convert: 17.4 x 25 000 = 435 000 cm = 4.35 km	M1
find maximum map length 17.6 + 0.2 = 17.8 cm and convert: 17.8 x 25 000 = 445 000 cm = 4.45 km	M1
state range 4.35 km to 4.45 km cao	A1

Answer: **4.35 km to 4.45 km**

Question 33

6 x 200 000 = 1 200 000 cm	M1
12 km cao	A1

Answer: **12 km**

Question 34

convert 22.5 m to cm = 2250 cm	M1
30 cm cao	A1

Answer: **30 cm**

Question 35

5.5 x 40 000 = 220 000 cm	M1
2.2 km cao	A1

Answer: **2.2 km**

Question 36

8.4 x 250 = 2100 cm	M1
21 m cao	A1

Answer: **21 m**

Question 37

convert map length to real distance: 24 x 50 000 = 1 200 000 cm = 12 km	M1
time = 12 / 5 = 2.4 hours	M1
2 hours 24 minutes cao	A1

Answer: **2 hours 24 minutes**

Question 38

real dimensions: 6 x 1000 = 6000 cm = 60 m and 4 x 1000 = 4000 cm = 40 m	M1
area = 60 x 40	M1
2400 m² cao	A1

Answer: **2400 m^2**

Question 39

convert 8.5 km to cm = 850 000 cm	M1
divide by map length: 850 000 / 17	M1
1:50 000 cao	A1

Answer: **1:50 000**

Question 40

straight-line real distance: 18 x 40 000 = 720 000 cm = 7.2 km	M1
apply 25% increase: 7.2 x 1.25	M1
9 km cao	A1

Answer: **9 km**

Question 41

real dimensions: 9x500=4500cm=45m and 5x500=2500cm=25m	M1
real area = 45 x 25 = 1125 m², then divide by 12.5	M1
90 spaces cao	A1

Answer: **90 spaces**

Question 42

convert real area to cm^2: 1 km² = 10 000 000 000 cm², so 18 km² = 180 000 000 000 cm²	M1
divide by the area scale factor $25\,000^2$ = 625 000 000	M1
288 cm² cao	A1

Answer: **288 cm^2**

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Question 43

3 km cao **B1**

Answer: **3 km**

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