

Name _____

Date _____

14.2 Scale drawings, maps and plans — worksheet

Use knowledge of scaling to interpret maps and plans, converting between distances on a drawing and real distances. · 57 questions · Show your working.

Remember

- A **scale** tells you what one length on a drawing stands for in real life.
- **Drawing → real: multiply. Real → drawing: divide.**
- A scale can be written as “1 cm represents 5 m” or as the ratio **1 : 500**.
- For a ratio scale, **both sides must be in the same units**: 5 m = 500 cm, so 1 cm to 5 m is 1 : 500.
- The bigger the second number, the **smaller** the drawing.
- Useful conversions: 100 cm = 1 m, 100 000 cm = 1 km.
- Every angle is unchanged, and every length is multiplied by the same number — the shape does not distort.
- Areas do **not** scale by the same number: doubling every length multiplies the area by 4.

A · Fluency — Convert between drawing lengths and real lengths.

- 1 A plan uses the scale 1 cm represents 2 m. A wall is 3 cm long on the plan. How long is the real wall, in metres?

- 2 A plan uses the scale 1 cm represents 4 m. A wall is 5 cm long on the plan. How long is the real wall, in metres?

- 3 A plan uses the scale 1 cm represents 10 m. A wall is 7 cm long on the plan. How long is the real wall, in metres?

- 4 A plan uses the scale 1 cm represents 50 m. A wall is 2 cm long on the plan. How long is the real wall, in metres?

- 5 A plan uses the scale 1 cm represents 25 m. A wall is 6 cm long on the plan. How long is the real wall, in metres?

- 6 A plan uses the scale 1 cm represents 100 m. A wall is 4 cm long on the plan. How long is the real wall, in metres?

- 7 A plan uses the scale 1 cm represents 5 m. A wall is 8 cm long on the plan. How long is the real wall, in metres?

- 8** A plan uses the scale 1 cm represents 20 m. A wall is 9 cm long on the plan. How long is the real wall, in metres?

- 9** A plan uses the scale 1 cm represents 3 m. A wall is 12 cm long on the plan. How long is the real wall, in metres?

- 10** A plan uses the scale 1 cm represents 2 m. A wall is 15 cm long on the plan. How long is the real wall, in metres?

- 11** A plan uses the scale 1 cm represents 4 m. A path is 24 m long. How long is it on the plan, in centimetres?

- 12** A plan uses the scale 1 cm represents 10 m. A path is 60 m long. How long is it on the plan, in centimetres?

- 13** A plan uses the scale 1 cm represents 50 m. A path is 150 m long. How long is it on the plan, in centimetres?

- 14** A plan uses the scale 1 cm represents 6 m. A path is 36 m long. How long is it on the plan, in centimetres?

- 15** A plan uses the scale 1 cm represents 25 m. A path is 200 m long. How long is it on the plan, in centimetres?

- 16** A plan uses the scale 1 cm represents 5 m. A path is 45 m long. How long is it on the plan, in centimetres?

- 17** A plan uses the scale 1 cm represents 100 m. A path is 300 m long. How long is it on the plan, in centimetres?

- 18** A plan uses the scale 1 cm represents 12 m. A path is 84 m long. How long is it on the plan, in centimetres?

- 19** A plan uses the scale 1 cm represents 8 m. A path is 72 m long. How long is it on the plan, in centimetres?

- 20** A plan uses the scale 1 cm represents 20 m. A path is 500 m long. How long is it on the plan, in centimetres?

- 21** A map has scale 1 : 100. A line is 4 cm long on the map. What real distance is that, in centimetres?

- 22** A map has scale 1 : 200. A line is 3 cm long on the map. What real distance is that, in centimetres?

- 23** A map has scale 1 : 50. A line is 6 cm long on the map. What real distance is that, in centimetres?

- 24** A map has scale 1 : 1000. A line is 5 cm long on the map. What real distance is that, in centimetres?

- 25** A map has scale 1 : 500. A line is 2 cm long on the map. What real distance is that, in centimetres?

- 26** A map has scale 1 : 20. A line is 7 cm long on the map. What real distance is that, in centimetres?

- 27** A map has scale 1 : 100. A line is 5 cm on the map. What real distance is that, in metres?

- 28** A map has scale 1 : 1000. A line is 8 cm on the map. What real distance is that, in metres?

- 29** A map has scale 1 : 500. A line is 6 cm on the map. What real distance is that, in metres?

- 30** A map has scale 1 : 200. A line is 9 cm on the map. What real distance is that, in metres?

- 31** A map has scale 1 : 2000. A line is 3 cm on the map. What real distance is that, in metres?

- 32** A map has scale 1 : 10000. A line is 4 cm on the map. What real distance is that, in metres?

B · Reasoning — What a scale means, and which way to go.

- 33** What does a scale of 1 : 500 mean?
- ☐ The map is 500 cm wide
 - ☐ 1 unit on the map is 500 of the same units in real life
 - ☐ The map is 500 times bigger than real life
 - ☐ 500 maps fit in real life
- 34** Going from a map distance to a real distance, you ...
- ☐ divide by the scale
 - ☐ multiply by the scale
 - ☐ add the scale
 - ☐ subtract the scale
- 35** Going from a real distance to a map distance, you ...
- ☐ divide by the scale
 - ☐ multiply by the scale
 - ☐ add the scale
 - ☐ subtract the scale
- 36** Why does a scale drawing keep every angle the same?
- ☐ Angles are always the same
 - ☐ Because every length is multiplied by the same number, so the shape does not distort
 - ☐ Because it is drawn on paper
 - ☐ Angles do change

- 37** On a scale drawing, is a scale of 1 : 100 smaller than 1 : 50?
☐ Yes
☐ No
- 38** A scale is written “1 cm represents 5 m”. As a ratio that is ...
☐ 1 : 5
☐ 1 : 50
☐ 1 : 500
☐ 1 : 5000
- 39** Why must both sides of a ratio scale be in the same units?
☐ It looks neater
☐ Otherwise the ratio means nothing
☐ So the numbers are small
☐ They need not be
- 40** Does a scale drawing of a house have the same shape as the house?
☐ Yes
☐ No
- 41** A model is built at 1 : 20. A real car is 4 m long. The model is ...
☐ 80 m
☐ 20 cm
☐ 4 cm
☐ 80 cm
- 42** On a map with scale 1 : 25 000, 1 cm represents ...
☐ 25 m
☐ 250 m
☐ 2.5 km
☐ 25 km

C · Challenge — Ratio scales, unit changes and areas.

- 43** A map has scale 1 : 50 000. Two towns are 6 cm apart on the map. How many kilometres apart are they?

- 44** A map has scale 1 : 25 000. Two villages are 8 km apart. How many centimetres apart are they on the map?

- 45** A plan of a room uses 1 cm to 25 cm. The room is 4 m wide. How wide is it on the plan, in centimetres?

- 46** A model aeroplane is made at a scale of 1 : 72. Its wingspan is 50 cm. What is the real wingspan, in metres?

- 47** A garden plan uses 1 cm to 2 m. A rectangular lawn measures 6 cm by 4 cm on the plan. What is its real area, in square metres?

- 48** A plan uses 1 cm to 3 m. A room is 15 m by 9 m. What are its dimensions on the plan, in centimetres? Give the longer one.

- 49** Two scales are offered for a plan: 1 : 100 and 1 : 250. Which gives the larger drawing? Answer with the second number.

D · Word problems — Maps, models, architects and surveyors.

- 50** A walking map has scale 1 : 25 000. A footpath measures 12 cm on the map. How long is it, in kilometres?

- 51** An architect draws a house at 1 cm to 2 m. The house is 14 m long. How long is the drawing, in centimetres?

- 52** A model railway is built at 1 : 76. A real carriage is 19 m long. How long is the model, in centimetres?

- 53** On a plan of a school, the hall is 9 cm long. The scale is 1 cm to 4 m. How long is the hall, in metres?

- 54** A map of an island uses 1 cm to 500 m. The island is 7 cm across on the map. How many kilometres is that?

- 55** A plan of a swimming pool uses 1 : 200. The pool is 10 cm long on the plan. How long is the real pool, in metres?

- 56** A surveyor's plan uses 1 : 1000. A field boundary is 250 m long. How long is it on the plan, in centimetres?

- 57** Two towns are 4.5 cm apart on a 1 : 200 000 map. How many kilometres apart are they?
