Ratios with Scale Drawings

Name: _____	Date: _____	Score: _____ / 24

Quick Review

A **scale drawing** (like a map or blueprint) shows a real object smaller or larger using a fixed ratio called the **scale**. A scale of "1 in : 4 ft" means every 1 inch on the drawing stands for 4 feet in real life. To find a **real distance**, multiply the drawing length by the scale factor: 3 inches becomes $3 \times 4 = 12$ feet. To find a **drawing length** from a real distance, divide instead. Keep the units in the same order as the scale, and your answer will make sense.

◇ **Example:** A map uses the scale 1 in : 25 mi. A road is 4 inches long on the map. How long is the real road?

⇒ The scale tells us each inch on the map stands for 25 real miles. To go from the drawing length to the real distance, we multiply by the scale factor. The road is 4 inches on the map, so we compute $4 \times 25 = 100$. The real road is 100 miles long. Since the real distance should be much bigger than the map length, multiplying makes sense.

Answer: 100 miles

PRACTICE

Use the given scale to find each missing length.

1. Scale 1 in : 4 ft. Drawing 3 in → real? _____
2. Scale 1 cm : 50 km. Drawing 6 cm → real? _____
3. Scale 1 in : 25 mi. Drawing 4 in → real? _____
4. Scale 1 cm : 100 cm. Drawing 5 cm → real? _____
5. Scale 1 in : 8 ft. Drawing 2.5 in → real? _____
6. Scale 1 in : 6 ft. Real 30 ft → drawing? _____
7. Scale 1 cm : 2 m. Real 18 m → drawing? _____
8. Scale 1 in : 5 ft. Drawing 7 in → real? _____
9. Scale 1 cm : 20 km. Drawing 9 cm → real? _____
10. Scale 1 in : 10 ft. Real 90 ft → drawing? _____
11. Scale 1 in : 12 ft. Drawing 4 in → real? _____
12. Scale 1 cm : 15 m. Drawing 8 cm → real? _____
13. Scale 1 in : 3 ft. Real 27 ft → drawing? _____
14. Scale 1 cm : 40 km. Drawing 7 cm → real? _____
15. Scale 1 in : 9 ft. Drawing 5 in → real? _____
16. Scale 1 cm : 5 m. Real 35 m → drawing? _____
17. Scale 1 in : 7 ft. Drawing 6 in → real? _____
18. Scale 1 in : 50 mi. Real 250 mi → drawing? _____
19. Scale 1 cm : 25 km. Drawing 12 cm → real? _____
20. Scale 1 in : 4 ft. Real 44 ft → drawing? _____

♦ Word Problems

21. On a map, the scale is 1 inch : 25 miles. Two cities are 4 inches apart on the map. What is the real distance between the cities? _____
22. A blueprint uses the scale 1 inch : 8 feet. A wall is drawn 2.5 inches long. How long is the real wall? _____
23. A model of a building uses the scale 1 cm : 2 m. The real building is 18 m tall. How tall is the model? _____
24. A floor plan uses the scale 1 inch : 6 feet. A real room is 30 feet wide. How wide is the room on the floor plan? _____

Answer Keys

1. 12 ft
2. 300 km
3. 100 mi
4. 500 cm
5. 20 ft
6. 5 in
7. 9 cm
8. 35 ft
9. 180 km
10. 9 in
11. 48 ft
12. 120 m
13. 9 in
14. 280 km
15. 45 ft
16. 7 cm
17. 42 ft
18. 5 in
19. 300 km
20. 11 in
21. 100 miles
22. 20 feet
23. 9 cm
24. 5 inches

Step-by-Step Explanations

1. Multiply by the scale: $3 \times 4 = 12$ feet.
2. Multiply by the scale: $6 \times 50 = 300$ km.
3. Multiply by the scale: $4 \times 25 = 100$ miles.
4. Multiply by the scale: $5 \times 100 = 500$ cm.
5. Multiply by the scale: $2.5 \times 8 = 20$ feet.
6. Divide by the scale: $30 \div 6 = 5$ inches.
7. Divide by the scale: $18 \div 2 = 9$ cm.
8. Multiply by the scale: $7 \times 5 = 35$ feet.
9. Multiply by the scale: $9 \times 20 = 180$ km.
10. Divide by the scale: $90 \div 10 = 9$ inches.
11. Multiply by the scale: $4 \times 12 = 48$ feet.
12. Multiply by the scale: $8 \times 15 = 120$ m.
13. Divide by the scale: $27 \div 3 = 9$ inches.
14. Multiply by the scale: $7 \times 40 = 280$ km.
15. Multiply by the scale: $5 \times 9 = 45$ feet.
16. Divide by the scale: $35 \div 5 = 7$ cm.
17. Multiply by the scale: $6 \times 7 = 42$ feet.
18. Divide by the scale: $250 \div 50 = 5$ inches.
19. Multiply by the scale: $12 \times 25 = 300$ km.
20. Divide by the scale: $44 \div 4 = 11$ inches.
21. Multiply the map distance by the scale: $4 \times 25 = 100$ miles.
22. Multiply the drawing length by the scale: $2.5 \times 8 = 20$ feet.
23. Divide the real height by the scale: $18 \div 2 = 9$ cm for the model.
24. Divide the real width by the scale: $30 \div 6 = 5$ inches on the plan.

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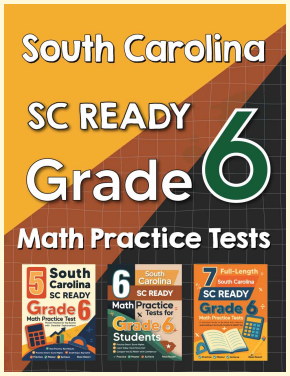

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