

Grade 7 · Scale Drawings · Worksheet Answer Key

Common Core 7.G.A.1 · mathovore.fr

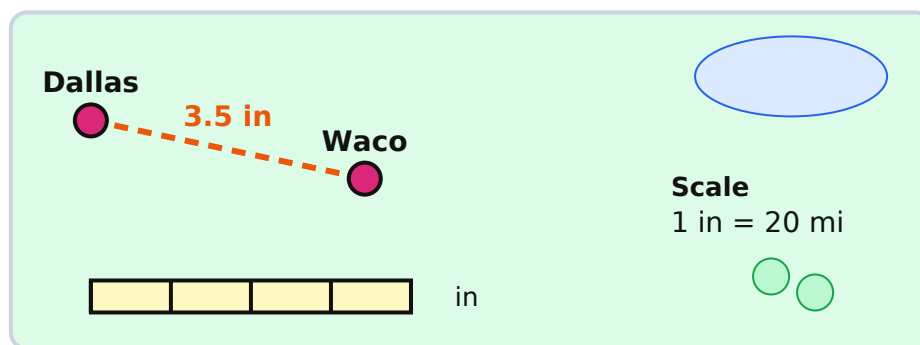
Each of the twenty solutions shows the multiplication or division by the scale, the units at every step, and a check. Remember that lengths scale by the scale factor but areas scale by its square. Compare your work with each step below.

Grade 7 Common Core: 7.G.A.1

Problem 1: Map distance

Each inch stands for 20 miles, so multiply: $3.5 \times 20 = 70$.

Answer: 70 miles.



$$3.5 \times 20 = 70 \text{ miles.}$$

Problem 2: City map

Each inch stands for 12 miles, so multiply: $6.5 \times 12 = 78$.

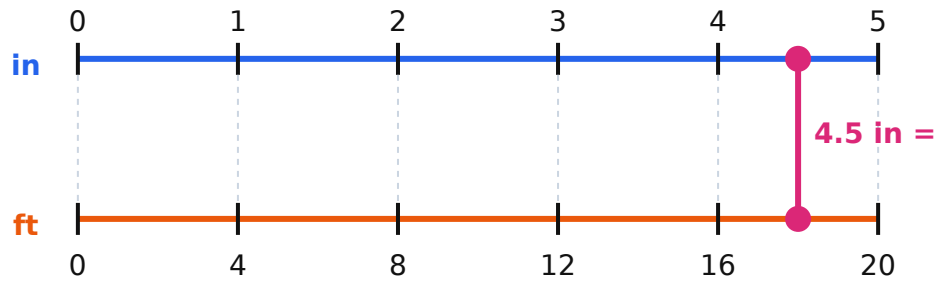
Answer: 78 miles.

Problem 3: Actual to drawing

Divide the actual length by the scale: $18 \div 4 = 4.5$.

Check: $4.5 \times 4 = 18$.

Answer: 4.5 in.



The pink line marks $4.5 \text{ in} = 18 \text{ ft}$.

Problem 4: Furniture plan

Divide the actual length by the scale: $7 \div 5 = 1.4$.

Check: $1.4 \times 5 = 7$.

Answer: 1.4 in.

Problem 5: Find the scale

Divide actual length by drawing length: $30 \div 6 = 5$.

Check: $6 \times 5 = 30$.

Answer: 1 in = 5 ft.

Problem 6: Model airplane

Divide the actual length by the model length: $28 \div 4 = 7$.

Check: $4 \times 7 = 28$.

Answer: 1 in = 7 ft.

Problem 7: Scale as a ratio

Convert 3 feet to inches: $3 \times 12 = 36 \text{ in}$.

So 1 in stands for 36 in.

Answer: 1:36 .

Problem 8: Yards to a ratio

Convert 10 yards to inches: $10 \times 36 = 360 \text{ in}$.

So 1 in stands for 360 in.

Answer: 1:360.

Problem 9: Half-inch scale

If $\frac{1}{2}$ in stands for 3 ft, then 1 in stands for 6 ft.

Length: $5 \times 6 = 30$ ft. Width: $3 \times 6 = 18$ ft.

Answer: 30 ft by 18 ft.

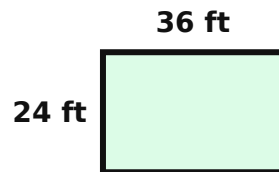
Problem 10: Blueprint of a room

Length: $9 \times 4 = 36$ ft. Width: $6 \times 4 = 24$ ft.

Area: $36 \times 24 = 864$ ft².

Check with the drawing area: $9 \times 6 = 54$ in², and $54 \times 4^2 = 864$.

Answer: 36 ft by 24 ft, area 864 ft².



Actual floor: 36 ft by 24 ft, area 864 ft² (shape only).

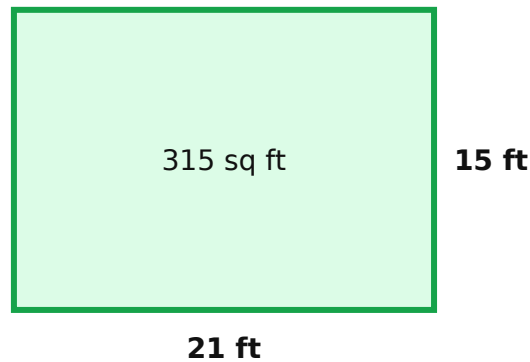
Problem 11: Classroom floor

Length: $7 \times 3 = 21$ ft. Width: $5 \times 3 = 15$ ft.

Area: $21 \times 15 = 315$ ft².

Check with the plan area: $7 \times 5 = 35$ in², and $35 \times 3^2 = 315$.

Answer: 21 ft by 15 ft, area 315 ft².



Actual floor: 315 ft^2 (shape only).

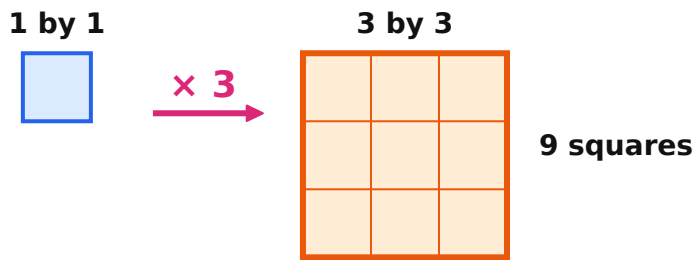
Problem 12: Area from a drawing

Actual length: $5 \times 3 = 15 \text{ ft}$. Actual width: $2 \times 3 = 6 \text{ ft}$.

Actual area: $15 \times 6 = 90 \text{ ft}^2$. Drawing area: $5 \times 2 = 10 \text{ in}^2$.

$90 \div 10 = 9 = 3^2$.

Answer: 90 ft^2 ; the actual area is 9 times the drawing area.



Area factor: $3 \times 3 = 9$.

Problem 13: Scale from area

Drawing area: $3 \times 2 = 6 \text{ in}^2$.

The area scales by the square of the scale: $864 \div 6 = 144$, and $144 = 12^2$, so $1 \text{ in} = 12 \text{ ft}$.

Actual length: $3 \times 12 = 36 \text{ ft}$. Actual width: $2 \times 12 = 24 \text{ ft}$. Check: $36 \times 24 = 864$.

Answer: $1 \text{ in} = 12 \text{ ft}$; 36 ft by 24 ft.

Problem 14: A new scale

Actual lengths: $4 \times 6 = 24$ ft and $2.5 \times 6 = 15$ ft.

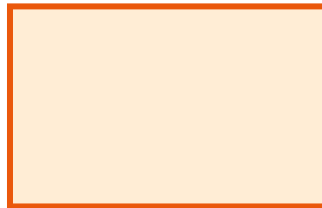
New drawing: $24 \div 3 = 8$ in and $15 \div 3 = 5$ in.

Answer: 8 in by 5 in.

4 in by 2.5 in



8 in by 5 in



Halving the scale unit doubles the drawing lengths (shown at 1/4 size).

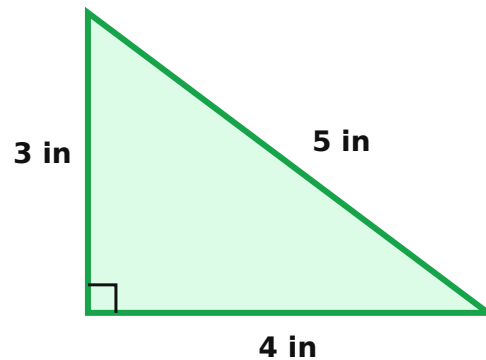
Problem 15: Redraw a triangle

(a) Multiply by 20: $1.5 \times 20 = 30$ ft, $2 \times 20 = 40$ ft, $2.5 \times 20 = 50$ ft.

(b) Divide by 10: $30 \div 10 = 3$ in, $40 \div 10 = 4$ in, $50 \div 10 = 5$ in.

(c) Perimeter: $3 + 4 + 5 = 12$ in.

(a) 30 ft, 40 ft, 50 ft; (b) 3 in, 4 in, 5 in; (c) 12 in



New drawing at 1 in = 10 ft (shown at one-half size).

Problem 16: Playground plan

Actual length: $1.5 \times 8 = 12$ ft. Actual width: $1 \times 8 = 8$ ft.

Perimeter: $2(12 + 8) = 40$ ft. Area: $12 \times 8 = 96$ ft².

Answer: perimeter 40 ft, area 96 ft².

Problem 17: Soccer field

Divide each actual length by 20: $120 \div 20 = 6$ in and $60 \div 20 = 3$ in.

The paper is 8.5 in by 11 in. Since $6 \leq 8.5$ and $3 \leq 11$, the drawing fits.

Answer: 6 in by 3 in; yes, it fits.

Problem 18: New floor

Actual length: $4 \times 5 = 20$ ft. Actual width: $3 \times 5 = 15$ ft.

Area: $20 \times 15 = 300$ ft².

Cost: $300 \times 2.50 = 750$.

Answer: 300 ft², cost \$750.

Problem 19: Road trip

Total map length: $2.4 + 3.1 = 5.5$ in.

Actual distance: $5.5 \times 15 = 82.5$ mi.

Time: $82.5 \div 55 = 1.5$ h.

Answer: 82.5 mi; 1.5 hours.

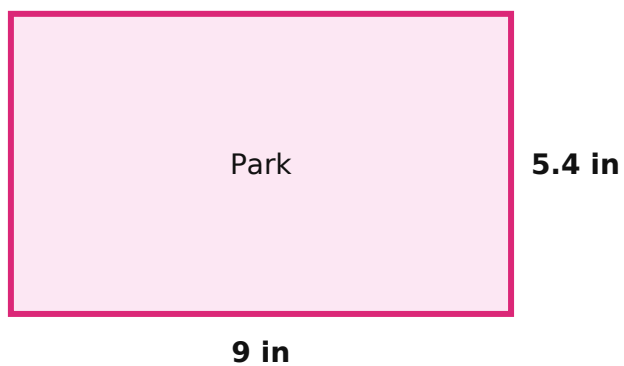
Problem 20: Park map on paper

At 1 in = 40 ft: $450 \div 40 = 11.25$ in, which is more than 9 in. It does not fit.

At 1 in = 50 ft: $450 \div 50 = 9$ in and $270 \div 50 = 5.4$ in. Both fit.

At 1 in = 60 ft: 7.5 in by 4.5 in fits, but it is smaller.

Answer: 1 in = 50 ft, drawing 9 in by 5.4 in.



The park at $1 \text{ in} = 50 \text{ ft}$ (shown at three-fourths size).