

Lesson 51 MEASURES

Area of triangles: half a rectangle

CURRICULUM ALIGNMENT

MEA.MSR.4a

determine and calculate units of measurement in fractional and/or decimal form to solve practical problems.

NUM.FRC.4a

explore (model, compare and convert) the relationships between fractions, decimals and percentages.

INTERACTIVES Shape Measurer · challenge, display, explore

WHAT THIS LESSON TEACHES

A triangle is half of a rectangle that shares the same base and perpendicular height, so its area is always $\frac{1}{2} \times \text{base} \times \text{height}$. Height means the straight-up distance from the base to the opposite corner, measured at a right angle, never along the slant.

→ A triangle with base 6 cm and height 4 cm has area $\frac{1}{2} \times 6 \times 4 = 12 \text{ cm}^2$.

→ A right triangle with base 5 cm and height 4 cm has area $\frac{1}{2} \times 5 \times 4 = 10 \text{ cm}^2$.

MODEL THIS ON THE BOARD

AREA OF A ROOF TRIANGLE

- 1 A builder needs the area of a triangular roof piece with base 5 cm and perpendicular height 4 cm.
- 2 Write the formula: area = $\frac{1}{2} \times \text{base} \times \text{height}$.
- 3 Substitute the numbers: $\frac{1}{2} \times 5 \times 4$.
- 4 First multiply $5 \times 4 = 20$.
- 5 Then take half of 20 to get 10.
- 6 The area is 10 cm².

ANSWER KEY

a) 9

b) 18

c) 24

Q1: 12 cm²Q2: 14 cm²

a) Always : That is exactly how the half-rectangle rule works.

b) Never : Height must be the perpendicular distance, never the slant.

c) Always : Half of 8×5 is 20.d) Sometimes : True when the height is 4 cm; false when the height is 6 cm, which gives 15 cm².

EXTENSION SHEET · STRETCH ANSWERS

S1: 22.5 cm²S2: 119 m²S3: 168 m²S4: 20 cm²S5: 30 cm²