

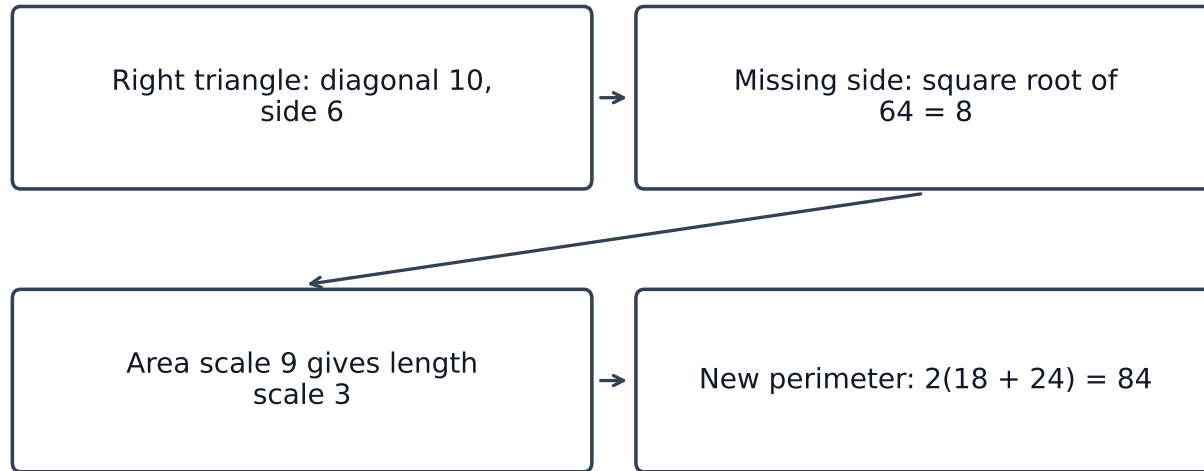
Exercise walk-through

13.1

Geometry: labelled facts, coordinates, circles and solids

GRE · GRE · GRE General Test

Figure 10: Worked reasoning



Check the labelled values and conditions.

13. Model and reasoning

Model and reasoning

Coordinate differences are six and eight. Distance is $\sqrt{6^2 + 8^2} = 10$ and midpoint $((-1 + 5)/2, (2 + 10)/2) = (2, 6)$. Cylinder volume is

$V = \pi r^2 h = \pi(3 \text{ cm})^2(4 \text{ cm}) = 36\pi \text{ cm}^3$. Total area is

$S = 2\pi r^2 + 2\pi rh = 2\pi(3 \text{ cm})^2 + 2\pi(3 \text{ cm})(4 \text{ cm}) = 42\pi \text{ cm}^2$. Volume and surface area measure different quantities.

15. Reasoning and check

Reasoning and check

A rectangle's adjacent sides are perpendicular. Its diagonal forms a right triangle, so the other side is $b = \sqrt{d^2 - a^2} = \sqrt{(10 \text{ cm})^2 - (6 \text{ cm})^2} = 8 \text{ cm}$. Area scale nine means length scale three. The new sides are 18 and 24 cm, giving perimeter $P = 2(a + b) = 2(18 + 24) \text{ cm} = 84 \text{ cm}$. An arbitrary quadrilateral need not supply a right angle, so its drawing alone would not justify the equation.

Exercises 2.1·3.1

2.1 Points $A=(-1,2)$ and $B=(5,10)$ are given. Find their distance and midpoint. A right circular cylinder has radius 3 cm and height 4 cm. Find its volume and total surface area, including both ends.

3 Exam-style questions

3.1 A rectangle has diagonal 10 cm and one side 6 cm. A similar rectangle has area nine times as large. Find its perimeter. Explain which labelled facts permit Pythagoras, and whether the same calculation would hold for an arbitrary quadrilateral.

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Local review checklist: follow every response instruction; support the answer with the stated evidence; explain rejected alternatives or an opposing view; check scope, restrictions and clarity. For writing, this is a formative checklist, not an official rubric score.