Solutions

Marking: **M1** a correct method, **A1** the correct answer.

Each answer shows the steps, then the **result**.

2.1

$$c = \sqrt{6^2 + 8^2} = \sqrt{100} = \mathbf{10} \text{ cm}$$

2.2

$$\sqrt{17^2 - 8^2} = \sqrt{289 - 64} = \sqrt{225} = \mathbf{15} \text{ cm}$$

2.3

$$c = \sqrt{5^2 + 12^2} = \sqrt{169} = \mathbf{13} \text{ cm}$$

2.4

- the longest side squared: $25^2 = 625$; the other two: $7^2 + 24^2 = 49 + 576 = 625$
- they are equal, so by the converse of Pythagoras the triangle is **right-angled**

2.5

- $c^2 = a^2 + b^2 = 3.5^2 + 4.2^2 = 12.25 + 17.64 = 29.89$

$$c = \sqrt{29.89} = 5.467\ldots = \mathbf{5.47} \text{ cm}$$

3.1

$$\sqrt{5^2 - 1.4^2} = \sqrt{25 - 1.96} = \sqrt{23.04} = \mathbf{4.80} \text{ m}$$

3.2

$$\sqrt{9^2 + 12^2} = \sqrt{81 + 144} = \sqrt{225} = \mathbf{15} \text{ cm}$$

3.3

- the height bisects the base, giving a right-angled triangle with hypotenuse 13 and base 5
- height $= \sqrt{13^2 - 5^2} = \sqrt{144} = \mathbf{12}$ cm
- area $= \frac{1}{2} \times 10 \times 12 = \mathbf{60}$ cm^2

3.4

- height $= \sqrt{50^2 - 40^2} = \sqrt{900}$
  $= \mathbf{30}$ inches
- area $= 40 \times 30 = \mathbf{1200}$ square inches

3.5

(a)

- Pythagoras: $x^2 + (x + 7)^2 = 13^2$, so $x^2 + x^2 + 14x + 49 = 169$
- $2x^2 + 14x - 120 = 0$; divide by 2: $x^2 + 7x - 60 = 0$

(b)

- $(x + 12)(x - 5) = 0$, so $x = -12$ or $x = 5$
- a length is positive: $x = \mathbf{5}$

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