

Pack A • Fluency

Answer all questions. Show your working. Questions are grouped by challenge level.

1. A rectangle has perimeter 16 cm. Give two different pairs of whole-number side lengths that would produce this perimeter. Verify each pair by adding.

2. A triangle has sides 5 cm, 7 cm and 9 cm. What is its perimeter? Show the addition.

3. A rectangle has area 24 cm^2 with whole-number sides. Give three different (length, width) pairs. Verify each by multiplying.

4. Find the area of a rectangle with length 9 cm and width 4 cm. Show the multiplication and write the units.

5. A right-angled triangle has base 6 cm and height 8 cm. Find its area. Explain why you halve the rectangle formula.

6. A shape has 4 sides and 2 lines of symmetry. Name two possibilities and justify each.

7. A cuboid has length 4 cm, width 3 cm and height 2 cm. Find its volume by multiplying length $\times$ width $\times$ height. Show each step.

8. A regular polygon has perimeter 35 cm and each side is 7 cm. Find the number of sides by dividing. State the name of the polygon.

9. A rectangle has perimeter 26 cm and length 8 cm. Find the width by calculation. Then find the area.

10. A compound shape is made from two rectangles. Rectangle A is $6 \text{ cm} \times 4 \text{ cm}$. Rectangle B is $3 \text{ cm} \times 2 \text{ cm}$. Find the total area by calculating each area separately then adding.

11. Find the area of a parallelogram with base 9 cm and perpendicular height 5 cm.
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12. Find the area of a trapezium with parallel sides 5 cm and 9 cm and perpendicular height 4 cm.
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13. Find the volume of a cuboid with length 5 cm, width 4 cm and height 3 cm.
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14. Find the surface area of a cuboid with length 5 cm, width 3 cm and height 2 cm.
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15. A compound shape is made from a rectangle 8 cm by 6 cm with a 2 cm square removed from one corner. Find the area.
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16. Find the perimeter of a regular 8-sided polygon with side length 5 cm.
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17. A net is folded to make a cuboid with dimensions 4 cm $\times$ 3 cm $\times$ 2 cm. How many faces does it have and what is its surface area?
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18. A triangle has base 8 cm and area 28 cm². Find its perpendicular height.
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19. How many faces, edges and vertices does a triangular prism have?
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20. A rectangle has a perimeter of 30 cm and a length of 9 cm. Find its width and hence its area.
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21. A rectangle has area 24 cm^2 and width 3 cm . Find its perimeter.
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22. A square has side 1.5 cm . Find its area in cm^2 and then convert it to mm^2 .
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23. A trapezium has parallel sides 4 cm and 8 cm . Its area is 30 cm^2 . Find its perpendicular height.
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24. A compound L-shape is formed by a large rectangle 10 cm by 8 cm with a smaller rectangle 4 cm by 3 cm cut from one corner. Find the area of the L-shape.
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25. A rectangle has length $(x + 3) \text{ cm}$ and width $(2x) \text{ cm}$. Write an expression for its perimeter and simplify.
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26. A rectangular garden is 3.2 m long and 2.5 m wide. Find its area in m^2 and convert the answer to cm^2 .
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27. A square has area 49 cm^2 . Find its perimeter.
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28. Find the surface area of a cuboid with dimensions $7 \text{ cm} \times 4 \text{ cm} \times 3 \text{ cm}$.
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29. A rectangle is 12 cm long and 5 cm wide. What is three-quarters of its area?
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30. A triangular prism has a triangular cross-section with base 6 cm and height 4 cm , and a length of 10 cm . Find its volume.
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31. A rectangle has length $(2x + 1)$ cm and width $(x - 2)$ cm. Its perimeter is 34 cm. Find x and hence find the area.
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32. A compound shape is made by joining a rectangle $10\text{ cm} \times 6\text{ cm}$ and a triangle with base 6 cm and height 4 cm along a shared edge of length 6 cm. Find the total area.
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33. A cuboid fish tank is 1.2 m long, 0.5 m wide and 0.4 m deep. It is filled to three-quarters of its height. Find the volume of water in litres. ($1\text{ m}^3 = 1\,000$ litres.)
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34. A square tile has perimeter 28 cm. Tiles are arranged in a 4×5 grid with no gaps. Find the total area of the tiled surface in cm^2 and convert to m^2 .
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35. Two identical trapeziums, each with parallel sides 5 cm and 11 cm and perpendicular height 6 cm, are placed together along their longer parallel side to form a parallelogram. Find the area of the parallelogram.
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36. A rectangle has length 10 cm and width 8 cm. Both dimensions are increased by 20%. Find the new area and the percentage increase in area.
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37. A cuboid has volume 120 cm^3 . Its length is 6 cm and its width is 4 cm. Find its height and hence its surface area.
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38. The area of a square is 196 cm^2 . Express 196 as a product of prime factors, and hence write down the exact side length of the square.
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39. A path of uniform width 2 cm runs around the outside of a rectangle $10\text{ cm} \times 6\text{ cm}$. Find the area of the path alone.
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40. A cube has surface area 216 cm^2 . Find its side length, volume and express the volume in litres.
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