

Pack B · Fluency

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

1. A rectangle has perimeter 24 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 6 cm, 8 cm and 11 cm. What is its perimeter? Show the addition.

3. A rectangle has area 36 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 7 cm and width 6 cm. Show the multiplication and write the units.

5. A right-angled triangle has base 10 cm and height 5 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 5 cm, width 4 cm and height 3 cm. Find its volume by multiplying length $\times$ width $\times$ height. Show each step.

8. A regular polygon has perimeter 48 cm and each side is 8 cm. Find the number of sides by dividing. State the name of the polygon.

9. A rectangle has perimeter 30 cm and length 11 cm. Find the width by calculation. Then find the area.

10. A compound shape is made from two rectangles. Rectangle A is $8 \text{ cm} \times 5 \text{ cm}$. Rectangle B is $4 \text{ cm} \times 3 \text{ cm}$. Find the total area by calculating each area separately then adding.

11. Find the area of a parallelogram with base 12 cm and perpendicular height 7 cm.
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12. Find the area of a trapezium with parallel sides 6 cm and 10 cm and perpendicular height 5 cm.
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13. Find the volume of a cuboid with length 8 cm, width 3 cm and height 4 cm.
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14. Find the surface area of a cuboid with length 6 cm, width 4 cm and height 3 cm.
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15. A compound shape is made from a rectangle 10 cm by 7 cm with a 3 cm square removed from one corner. Find the area.
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16. Find the perimeter of a regular 7-sided polygon with side length 6 cm.
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17. A net is folded to make a cuboid with dimensions 5 cm $\times$ 2 cm $\times$ 3 cm. How many faces does it have and what is its surface area?
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18. A triangle has base 10 cm and area 35 cm². Find its perpendicular height.
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19. How many faces, edges and vertices does a square-based pyramid have?
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20. A rectangle has a perimeter of 40 cm and a length of 13 cm. Find its width and hence its area.
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21. A rectangle has area 45 cm^2 and width 5 cm. Find its perimeter.
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22. A square has side 2.5 cm. Find its area in cm^2 and then convert it to mm^2 .
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23. A trapezium has parallel sides 5 cm and 11 cm. Its area is 48 cm^2 . Find its perpendicular height.
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24. A compound L-shape is formed by a large rectangle 12 cm by 7 cm with a smaller rectangle 5 cm by 4 cm cut from one corner. Find the area of the L-shape.
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25. A rectangle has length $(x + 5)$ cm and width $(3x)$ cm. Write an expression for its perimeter and simplify.
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26. A rectangular garden is 4.5 m long and 1.8 m wide. Find its area in m^2 and convert the answer to cm^2 .
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27. A square has area 121 cm^2 . Find its perimeter.
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28. Find the surface area of a cuboid with dimensions $8 \text{ cm} \times 5 \text{ cm} \times 2 \text{ cm}$.
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29. A rectangle is 15 cm long and 8 cm wide. What is 40% of its area?
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30. A triangular prism has a triangular cross-section with base 8 cm and height 5 cm, and a length of 9 cm. Find its volume.
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31. A rectangle has length $(2x + 3)$ cm and width $(x - 1)$ cm. Its perimeter is 40 cm. Find x and hence find the area.
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32. A compound shape is made by joining a rectangle $12\text{ cm} \times 8\text{ cm}$ and a triangle with base 8 cm and height 5 cm along a shared edge of length 8 cm. Find the total area.
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33. A cuboid fish tank is 1.5 m long, 0.6 m wide and 0.5 m deep. It is filled to 80% 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 32 cm. Tiles are arranged in a 3×6 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 7 cm and 13 cm and perpendicular height 8 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 15 cm and width 6 cm. Both dimensions are increased by 10%. Find the new area and the percentage increase in area.
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37. A cuboid has volume 210 cm^3 . Its length is 7 cm and its width is 5 cm. Find its height and hence its surface area.
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38. The area of a square is 324 cm^2 . Express 324 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 3 cm runs around the outside of a rectangle $14\text{ cm} \times 8\text{ cm}$. Find the area of the path alone.
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40. A cube has surface area 486 cm^2 . Find its side length, volume and express the volume in litres.
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