Drawing nets of 3D shapes — Solutions

Answers and worked steps for net identification and construction problems.

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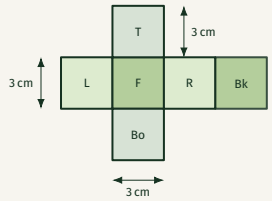
Solution approach

These solutions show how to identify 3D shapes from their nets and verify properties of nets. For drawing questions, accept any valid net for the specified shape.

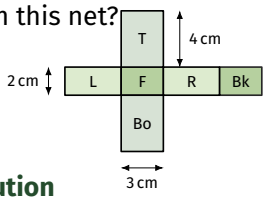
Worked example

Which 3D shape matches this net?



Six equal squares in a cross shape fold into a cube – each square becomes one face. All edges of the cube are equal to 3 cm.

1. What 3D shape can be folded from this net?



Solution

A cuboid (rectangular prism) with dimensions 4 cm × 3 cm × 2 cm

2. How many faces does a cube have?

Solution

6 faces

3. Count the squares in the cube net shown in the worked example.

Solution

6 squares

4. Draw a net for a cube with side length 2 cm. (Draw your answer below)

Solution

Accept any valid cube net (there are 11 different valid nets for a cube)

5. What is the difference between a cube net and a cuboid net?

Solution

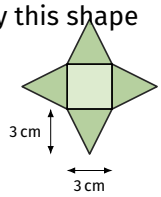
A cube net has 6 equal squares arranged in a cross pattern. A cuboid net has rectangles of different sizes: two 5×3 pairs, two 5×2 pairs, and two 3×2 pairs.

6. A cuboid has dimensions 5 cm × 3 cm × 2 cm. List the dimensions of each rectangular face in its net.

Solution

5 cm × 3 cm, 5 cm × 3 cm, 5 cm × 2 cm, 5 cm × 2 cm, 3 cm × 2 cm, 3 cm × 2 cm

7. Identify this shape



Solution

Square pyramid with base 3 cm × 3 cm

8. How many triangular faces does a square pyramid have?

Solution

4 triangular faces

9. Can a cube net have all six squares in a straight line?

Solution

No. If six squares are in a straight line, when folded, opposite faces would overlap and it wouldn't form a closed cube.

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10. Draw a net for a rectangular prism (cuboid) with base 4 cm × 4 cm and height 2 cm.

Solution

Accept any valid net showing two 4×4 squares and four 4×2 rectangles arranged to fold into the cuboid

11. List the three 3D shapes shown in the questions above.

Solution

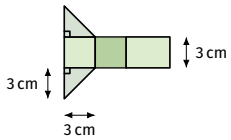
Cube, cuboid (rectangular prism), square pyramid

12. What property do all nets of the same shape share?

Solution

All nets of the same shape have the same number of faces and edges with the same dimensions. They all fold into congruent 3D shapes.

13. Identify this triangular prism net



Solution

Triangular prism with triangular faces (base 3 cm, height 3 cm) and rectangular side faces

14. How many rectangular faces does a triangular prism have?

Solution

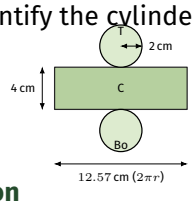
3 rectangular faces (one for each edge of the triangle)

15. Draw a net for this triangular prism

Solution

Accept any valid triangular prism net showing two triangles and three rectangles

16. Identify the cylinder net



Solution

Cylinder with radius 2 cm and height 4 cm

17. What shapes make up a cylinder net?

Solution

A cylinder net consists of two circles (the top and bottom) and one rectangle (the curved side surface unrolled)

18. If a cylinder has radius 2 cm and height 5 cm, what is the width of the rectangle in its net?

Solution

The width is the circumference:
$2\pi r = 2\pi(2) = 4\pi \approx 12.57$ cm

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19. How many faces, edges, and vertices does a cube have?

Solution

F = 6, E = 12, V = 8

20. How many faces, edges, and vertices does a triangular prism have?

Solution

F = 5, E = 9, V = 6

21. How many faces, edges, and vertices does a square pyramid have?

Solution

F = 5, E = 8, V = 5

22. Draw another valid net for a cube (different from the one in question 4)

Solution

Accept any valid cube net different from the solution in Q4 (11 different valid nets exist)

23. Explain why these two nets both fold into cubes:

Solution

Both nets have exactly 6 squares, all the same size. Different arrangements still fold into cubes because the squares align correctly when folded.

24. A net has 2 squares side-by-side, then 4 more squares attached. Could it be a cube net? Explain.

Solution

No. This arrangement (2-4 pattern) is not a valid cube net because when folded, some faces overlap or leave gaps. Only certain arrangements of 6 squares form valid nets.

25. Draw a net for a square pyramid with base 3 cm × 3 cm and slant height 4 cm

Solution

A square base 3×3 with four triangles (base 3 cm, height 4 cm) attached to each side

26. What is the total surface area of the cube net from question 4 (with 2 cm sides)?

Solution

Surface area = $6 \times (2 \times 2) = 6 \times 4 = 24$ cm²

27. Using the cuboid dimensions from question 6 (5 × 3 × 2 cm), calculate the total surface area from its net.

Solution

Surface area = $2(5\times3) + 2(5\times2) + 2(3\times2) = 30 + 20 + 12 = 62$ cm²