FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

G12: 3D shapes

Solve problems involving faces, edges and vertices

20 marks · 25 minutes · Non-calculator

1) A prism has 24 edges. Find its number of faces and vertices.

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[Question 1: 3 marks]

2) A pyramid has 10 faces. How many edges does it have?

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[Question 2: 3 marks]

3) The net of a cube has an area of 150 cm^2. Find the volume of the cube.

..... cm^3

[Question 3: 3 marks]

4) The edges of a cuboid add up to 60 cm. Its dimensions are in the ratio 1 : 2 : 2. Find its volume.

..... cm^3

[Question 4: 4 marks]

5) A solid has the same number of faces as vertices and has 10 edges. Use $F + V - E = 2$ to identify it.

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[Question 5: 3 marks]

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6) A painted cube is cut into 27 equal small cubes. How many small cubes have exactly two painted faces?

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[Question 6: 2 marks]

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7) A square-based pyramid is glued onto one face of a cube. Find the faces, edges and vertices of the new solid and check Euler's formula.

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[Question 7: 2 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	10 faces, 16 vertices	Cross-section 8 sides (P1); $F = 10$ (A1); $V = 16$ (A1).
2	18	Base has 9 sides (P1, P1); 2×9 (A1).
3	125	Face $25\,\text{cm}^2$ (P1); side 5 (P1); A1.
4	108	$4(k + 2k + 2k) = 60$ (P1); $k = 3$ (P1); 3, 6, 6 (P1); A1.
5	Pentagonal pyramid	$F = V = 6$ (P1, P1); A1.
6	12	One on each edge (P1); A1.
7	$F = 9$, $E = 16$, $V = 9$	Counts (P1); $9 + 9 - 16 = 2$ (A1).