2.96 Nets and 3D Shape Reasoning: Test Pack

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 15 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A polyhedron has 10 faces and 16 vertices. Use Euler's formula to find the number of edges.

(4)

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2 How many faces does a square-based pyramid have?

- ☐ A) 3
- ☐ B) 4
- ☐ C) 5
- ☐ D) 6
- ☐ E) 8

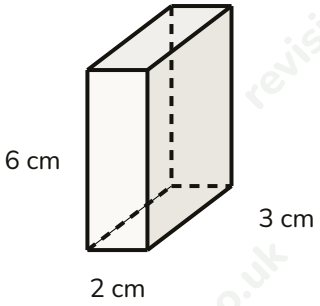
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3 A triangular prism has 5 faces and 9 edges. Use Euler's formula V - E + F = 2 to find the number of vertices V.

(2)

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4 A cuboid measures 2 cm by 3 cm by 6 cm. Calculate its total surface area. Then state how many faces, edges and vertices the cuboid has.



(4)

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5 How many vertices does a hexagonal-based prism have?

- ☐ A) 11
- ☐ B) 12
- ☐ C) 13
- ☐ D) 8
- ☐ E) 18

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6 Name the solid. Then give the number of faces, edges and vertices.

(3)

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Mark scheme · 2.96 Nets and 3D Shape Reasoning: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

Euler's formula used: V - E + F = 2	**M1**
Substitute 16 - E + 10 = 2 seen	**M1**
Rearrangement to find E shown: 26 - E = 2 or E = 24	**M1**
E = 24 cao	**A1**

Answer: 24 edges. (16 - E + 10 = 2 so E = 24.)

Question 2

correct option C (5 faces) cao	**B1**

Answer: C) 5 faces

Question 3

Euler's formula stated or used: V - 9 + 5 = 2 or equivalent	**M1**
V = 6 cao	**A1**

Answer: 6 vertices. (V - 9 + 5 = 2 so V = 6.)

Question 4

Areas of opposite faces seen: 2x3, 3x6 and 2x6 (6, 18, 12) or equivalent	**M1**
Sum inside brackets 6 + 18 + 12 = 36 seen	**M1**
Total surface area 2 x 36 = 72 cm² cao	**A1**
Faces = 6, edges = 12, vertices = 8 stated correctly	**B1**

Answer: Total surface area = 72 cm^2; faces = 6; edges = 12; vertices = 8.

Question 5

correct option B (12) cao	**B1**

Answer: B) 12

Question 6

Name given as 'triangular prism' oe	**M1**
Number of faces stated as 5 and number of edges stated as 9 (method or statement)	**M1**
Number of vertices stated correctly as 6 cao	**A1**

Answer: Triangular prism; faces = 5, edges = 9, vertices = 6. (2 triangular faces and 3 rectangular faces.)

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