THREE-DIMENSIONAL SHAPES

A THREE-DIMENSIONAL SHAPES

A.1 IDENTIFYING FLAT OR SOLID SHAPES

MCQ 1: Is this shape flat or solid?



Pick the right answer:

 \boxtimes 2D shape

 \Box 3D shape

 ${\scriptstyle Answer:}$ It is a 2D shape because it's flat, with only length and width.

MCQ 2: Is this shape flat or solid?



Pick the right answer:

 \square 2D shape

 \boxtimes 3D shape

 ${\scriptstyle Answer:}$ It is a 3D shape because it's solid, with length, width, and depth.

MCQ 3: Is this shape flat or solid?



Pick the right answer:

 \square 2D shape

 \boxtimes 3D shape

 ${\scriptstyle Answer:}$ It is a 3D shape because it's solid, with length, width, and depth.

MCQ 4: Is this shape flat or solid?



Pick the right answer:

- \boxtimes 2D shape
- \Box 3D shape

 ${\scriptstyle Answer:}$ It is a 2D shape because it's flat, with only length and width.

MCQ 5: Is this shape flat or solid?



Pick the right answer:

- \boxtimes 2D shape
- \Box 3D shape

 ${\it Answer:}$ It is a 2D shape because it's flat, with only length and width.

MCQ 6: Is this shape flat or solid?



Pick the right answer:

 \Box 2D shape

 \boxtimes 3D shape

 ${\scriptstyle Answer:}$ It is a 3D shape because it's solid, with length, width, and depth.

A.2 COUNTING FACES

Ex 7: How many faces does this cube have?



Answer: Count each flat surface to find the number of faces.





There 6 faces.

Ex 8: How many faces does this square Pyramid have?



Answer: Count each flat surface to find the number of faces



There are 5 faces.

Ex 9: How many faces does this triangular pyramid have?



Answer: Count each flat surface to find the number of faces.



There are 4 faces.

Ex 10: How many faces does this eight-faced die have?







There are ${\bf 8}$ faces.

A.3 COUNTING EDGES





Answer: Count each line where two faces meet to find the number of edges.



There are **12 edges**.

Ex 12: How many edges does this eight-faced die have?



 ${\it Answer:}$ Count each line where two faces meet to find the number of edges.



(*<u>*</u>)



There are 12 edges.

Ex 13: How many edges does this square Pyramid have?



Answer: Count each line where two faces meet to find the number of edges.



There are 8 edges.

A.4 COUNTING VERTICES





Answer: Count each corner where the lines meet to find the number of vertices.



There are 8 vertices.

Ex 15: How many vertices does this eight-faced die have?



 ${\it Answer:}$ Count each corner where the lines meet to find the number of vertices.



There are 6 vertices.

Ex 16: How many vertices does this triangular pyramid have?



Answer: Count each corner where the lines meet to find the number of vertices.



There are 4 vertices.

B POLYHEDRON

B.1 IDENTIFYING POLYHEDRONS

MCQ 17: Is this 3D figure a polyhedron?



Choose one answer:

X True

 \Box False

Answer: The correct answer is: True.

A polyhedron is a 3D shape with flat polygonal faces, straight edges, and sharp vertices. This figure is a square-based pyramid (tetrahedron with a square base), which has one square base and four triangular faces. Since all faces are flat polygons with straight edges and sharp vertices, this figure is a polyhedron.

MCQ 18: Is this 3D figure a polyhedron?



Choose one answer:

□ True

 \boxtimes False

Answer: The correct answer is: False.

A polyhedron is a 3D shape with flat polygonal faces, straight edges, and sharp vertices. This figure is a cylinder, which has two circular bases and a curved surface connecting them. Since a cylinder has a curved surface instead of flat polygonal faces, it is not a polyhedron.

MCQ 19: Is this 3D figure a polyhedron?



Choose one answer:

⊠ True

 \Box False

Answer: The correct answer is: True.

A polyhedron is a 3D shape with flat polygonal faces, straight edges, and sharp vertices. This figure is a rectangular prism, which has six rectangular faces. Since all faces are flat polygons with straight edges and sharp vertices, this figure is a polyhedron.



Choose one answer:

□ True

⊠ False

Answer: The correct answer is: False.

A polyhedron is a 3D shape with flat polygonal faces, straight edges, and sharp vertices. This figure is a sphere, which has a completely curved surface and no flat faces, straight edges, or vertices. Therefore, a sphere is not a polyhedron.

C CROSS SECTIONS

C.1 IDENTIFYING UNIFORM CROSS SECTION

MCQ 21: Does this 3D shape have a uniform cross section?



Choose one answer:

⊠ True

 \Box False

Answer: The correct answer is: True.

A uniform cross section means the cross section of a solid has the same size and shape at every point along its length. This figure is a rectangular prism, and when sliced perpendicular to its length, each cross section is a rectangle of the same size and shape, confirming it has a uniform cross section.



MCQ 22: Does this 3D shape have a uniform cross section?



square-based pyramid

Choose one answer:

- □ True
- \boxtimes False

Answer: The correct answer is: False.

A uniform cross section means the cross section of a solid has the same size and shape at every point along its length. This figure is a square-based pyramid, which tapers to a point (apex) from a square base. When sliced perpendicular to its height, the cross sections are squares, but they decrease in size as you move toward the apex, meaning the cross section is not uniform.





pyramide à base carrée

MCQ 23: Does this 3D shape have a uniform cross section?



Choose one answer:



 \Box False

Answer: The correct answer is: True.

A uniform cross section means the cross section of a solid has the same size and shape at every point along its length. This figure is a cylinder, and when sliced perpendicular to its length, each cross section is a circle of the same size and shape, confirming it has a uniform cross section.







Choose one answer:

⊠ True

 \Box False

Answer: The correct answer is: True.

A uniform cross section means the cross section of a solid has the same size and shape at every point along its length. This building is shaped like a rectangular prism, and when sliced perpendicular to its height, each cross section is a rectangle of the same size and shape, confirming it has a uniform cross section.

MCQ 25: Does this 3D shape have a uniform cross section?



Choose one answer:

- □ True
- \boxtimes False

Answer: The correct answer is: False.

A uniform cross section means the cross section of a solid has the same size and shape at every point along its length. This figure is a sphere, and when sliced perpendicular to any axis, the cross sections are circles, but their sizes vary depending on the position of the slice (largest at the center, smaller near the edges). Therefore, the cross section is not uniform.

D CLASSIFICATION

D.1 CLASSIFYING 3D SHAPES

MCQ 26: Which 3D shape is shown below?



Choose one answer:

- ⊠ Cone
- \Box Cylinder
- \Box Triangular prism

Answer: The correct answer is: Cone.

A cone is a 3D shape with a single circular base and a curved surface that tapers to a point called the apex. The shape above has a circular base and a curved surface leading to a single apex, matching the description of a cone.

MCQ 27: Which 3D shape is shown below?



Choose one answer:

\Box Cone

- \Box Triangular prism
- \boxtimes Rectangular prism

Answer: The correct answer is: Rectangular prism.

A rectangular prism has two parallel rectangular bases connected by four rectangular faces. The shape above has rectangular bases and faces, matching the description of a rectangular prism.

MCQ 28: Which 3D shape is shown below?



The shape above matches this description.

Answer: The correct answer is: Sphere.

A sphere is a 3D shape where every point on the surface is equidistant from its center. The shape above is a round object with a uniform curved surface, matching the description of a sphere.

MCQ 29: Which 3D shape is shown below?



Choose one answer:

- \Box Cylinder
- \boxtimes Triangular prism
- $\Box\,$ Rectangular prism

Answer: The correct answer is: Triangular prism. A triangular prism has two parallel triangular bases connected by three rectangular faces. The shape above has triangular bases and rectangular lateral faces, matching the description of a triangular prism.

MCQ 30: Which 3D shape is shown below?



Choose one answer:

- \boxtimes Cylinder
- \Box Cone
- \Box Sphere

Answer: The correct answer is: Cylinder.

A cylinder has two parallel circular bases connected by a curved surface. The shape above has two circular bases and a curved surface connecting them, matching the description of a cylinder.





Choose one answer:

- \Box Rectangular pyramid
- $\Box\,$ Square pyramid
- \boxtimes Cube

Answer: The correct answer is: Cube.

A cube is a 3D shape with six square faces of equal size, where all edges are of the same length. The shape above has six square faces of equal size, matching the description of a cube.

E DRAWING THREE-DIMENSIONAL SHAPES

E.1 COUNTING VISIBLE AND HIDDEN EDGES

Ex 32: Count the number of visible and hidden edges on this cube



3 hidden edges

Answer:

• 9 visible edges:



• 3 hidden edges:





Ex 33: Count the number of visible and hidden edges on this eight-faced die.



Answer:

• 8 visible edges



• 4 hidden edges



Ex 34: Count the number of visible and hidden edges on this square Pyramid.



Answer: Count each line where two faces meet to find the number of edges.



There are 8 edges.

E.2 DRAWING THREE-DIMENSIONAL SHAPES

Ex 35:



Draw this cube on your graph paper.

Answer:

1. Draw the visible edges with solid lines:



2. Draw the hidden edges with dotted lines:



Ex 36:



Draw this cube on your graph paper.



Answer:



1. Draw the visible edges with solid lines:



2. Draw the hidden edges with dotted lines:



Ex 37:



Draw this triangular prism on your graph paper.



Answer:

1. Draw the visible edges with solid lines:



2. Draw the hidden edges with dotted lines:



Ex 38:



Draw this pyramid on your graph paper.



Answer:

1. Draw the visible edges with solid lines:



2. Draw the hidden edges with dotted lines:



F MULTI-VIEW PROJECTION

F.1 FINDING THE PROJECTION

 \mathbf{MCQ} 39: Identify the front view of this solid.



Choose one answer:





Answer: The correct front view is the second option:









Choose one answer:



Answer: The correct right view is the third option:



 top





Choose one answer:



Choose one answer:



Answer: The correct top view is the first option:



MCQ 41: Identify the right view of this solid.







Answer: The right view is:



Ex 45: Draw the top view of this solid on your graph paper.

top



Answer: The front view is:



Ex 44: Draw the right view of this solid on your graph paper.

Answer: The top view is:







Answer: The correct front view is the third option:





Ex 43: Draw the front view of this solid on your graph paper.









Ex 46: Draw the front view of this solid on your graph paper.





Answer: The front view is:



G SOLID CONSTRUCTIONS

G.1 IDENTIFYING NETS

MCQ 47: Identify the net that can be folded to form this 3D shape.





Answer: The correct net is the third option:

Choose one answer:





A cube has 6 square faces. The third net has 6 squares arranged in a cross pattern, which can be folded to form a cube.

MCQ 48: Identify the net that can be folded to form this 3D shape.



Choose one answer:





Answer: The correct net is the first option:



A square-based pyramid has 1 square base and 4 triangular faces. The first net has 1 square and 4 triangles arranged around it, which can be folded to form a square-based pyramid.

MCQ 49: Identify the net that can be folded to form this 3D shape.



Choose one answer:



Answer: The correct net is the fourth option:



A triangular prism has 2 triangular bases and 3 rectangular faces. The fourth net has 2 triangles and 3 rectangles arranged in a pattern that can be folded to form a triangular prism.

 $\mathbf{MCQ}\ \mathbf{50:}\ \ \mathbf{Identify}\ \mathbf{the}\ \mathbf{net}\ \mathbf{that}\ \mathbf{can}\ \mathbf{be}\ \mathbf{folded}\ \mathbf{to}\ \mathbf{form}\ \mathbf{this}\ \mathbf{3D}\ \mathbf{shape.}$



Choose one answer:





Answer: The correct net is the second option:



Follow these steps: Draw the net on graph paper, cut it out with the tabs, fold along the edges of the squares, and glue the tabs to the corresponding faces to form the cube.

Ex 52: Draw this net on graph paper. Cut it out (keeping the tabs), fold it, and glue the tabs to form a square-based pyramid. You can decorate its different faces. I look forward to seeing your photographs.



Answer: Your square-based pyramid should look like this:

Follow these steps: Draw the net on graph paper, cut it out with the tabs, fold along the edges of the square base and triangles, and glue the tabs to the corresponding faces to form the pyramid.

 $\binom{\bullet}{\bullet}$

A tetrahedron has 4 triangular faces. The second net has 4 triangles arranged in a pattern that can be folded to form a tetrahedron.

G.2 CONSTRUCTING 3D SOLIDS FROM PAPER

Ex 51: Draw this net on graph paper. Cut it out (keeping the tabs), fold it, and glue the tabs to form a cube. You can decorate its different faces. I look forward to seeing your photographs.



Answer: Your cube should look like this: