

NCERT Solutions Class 10th Maths Chapter 13 Surface Areas and Volumes | Updated 2026-27

⚡ Quick Revision Box — Chapter 13 Surface Areas and Volumes

- **Chapter:** 13 — Surface Areas and Volumes | Class 10 Maths NCERT
- **Exercise 13.1 focus:** Surface area of combination of solids (NOT volume)
- **Key rule:** Add only the *visible* surface areas — do not include hidden/joined faces
- **Most tested shapes:** Cylinder + Cone, Cylinder + Hemisphere, Cube + Hemisphere
- **Slant height formula:** $l = \sqrt{r^2 + h^2}$ — used in cone problems
- **π value used:** $22/7$ unless stated otherwise
- **Total questions in Ex 13.1:** 9 questions — all solved below with full working
- **Board exam weightage:** Mensuration unit carries 10–12 marks in CBSE Class 10 board exams

ncert solutions class 10th maths chapter 13 surface areas volumes — ncertbooks.net

The **NCERT Solutions Class 10th Maths Chapter 13 Surface Areas and Volumes** on this page cover all 9 questions of Exercise 13.1, fully updated for the **2026-27** CBSE board exam. This chapter teaches you how to calculate the surface area of objects made by combining two or more basic solids — a skill tested directly in board papers every year. You can find the complete [NCERT Solutions for Class 10 Maths](#) on our hub page, and browse all subjects under [NCERT Solutions](#) for Classes 1–12. The official textbook is available on the [NCERT official website](#).

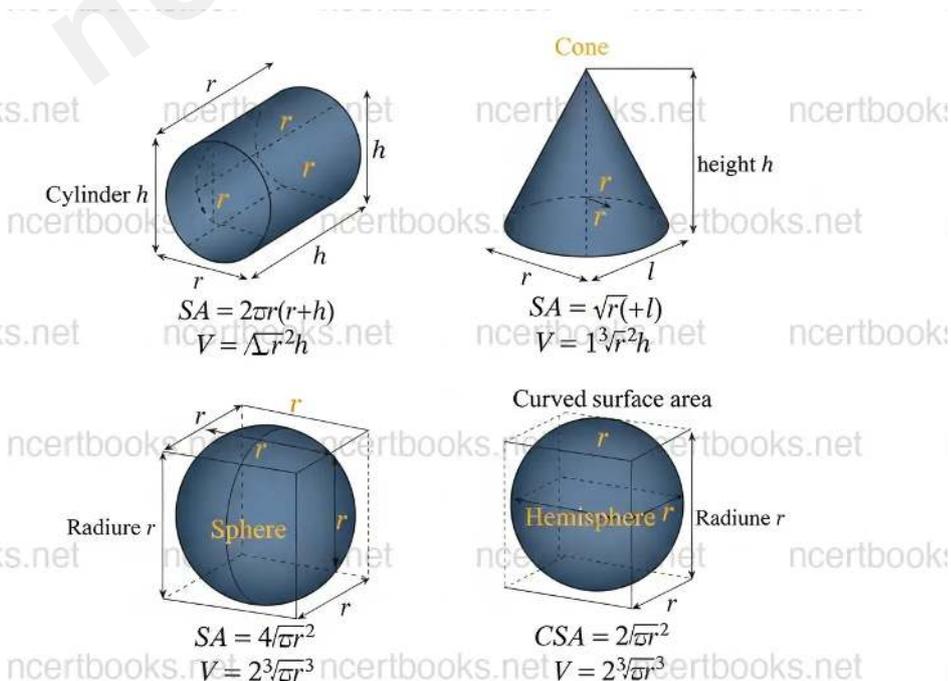


Fig 13.1: Surface area and volume formulas for cylinder, cone, sphere, and hemisphere

Chapter Overview — NCERT Solutions Class 10th Maths Chapter 13 Surface Areas and Volumes

Chapter 13 of the NCERT Class 10 Maths textbook (*Mathematics — Textbook for Class X*) deals with finding the surface areas and volumes of solids formed by combining two or more basic 3D shapes. Exercise 13.1 specifically focuses on **surface area of a combination of solids** — one of the most commonly tested topics in CBSE board exams.

This chapter builds directly on your knowledge of basic mensuration from Classes 8 and 9 — surface areas of cubes, cuboids, cylinders, cones, and spheres. If you are comfortable with those formulas, this chapter becomes straightforward. The key new idea here is that when two solids are joined, the *joined surface is not visible* and must not be counted.

Detail	Information
Chapter	13 — Surface Areas and Volumes
Textbook	NCERT Mathematics Class X
Class	10 (Secondary)
Subject	Mathematics
Exercise covered	Exercise 13.1 (9 questions)
Marks Weightage	Mensuration unit: ~10–12 marks in CBSE board
Difficulty Level	Medium
Academic Year	2026-27

Frustum of a cone

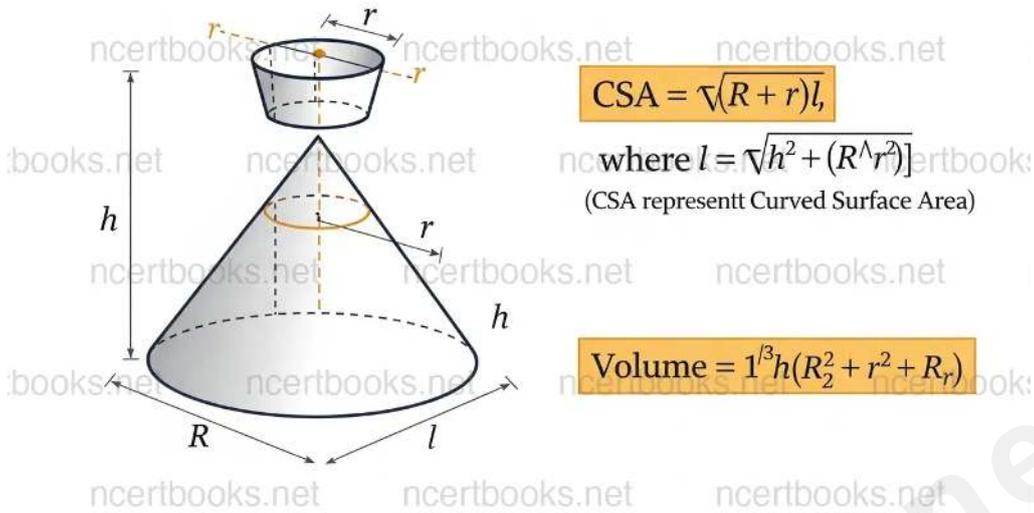


Fig 13.2: Frustum of a cone — formed by cutting a cone parallel to its base

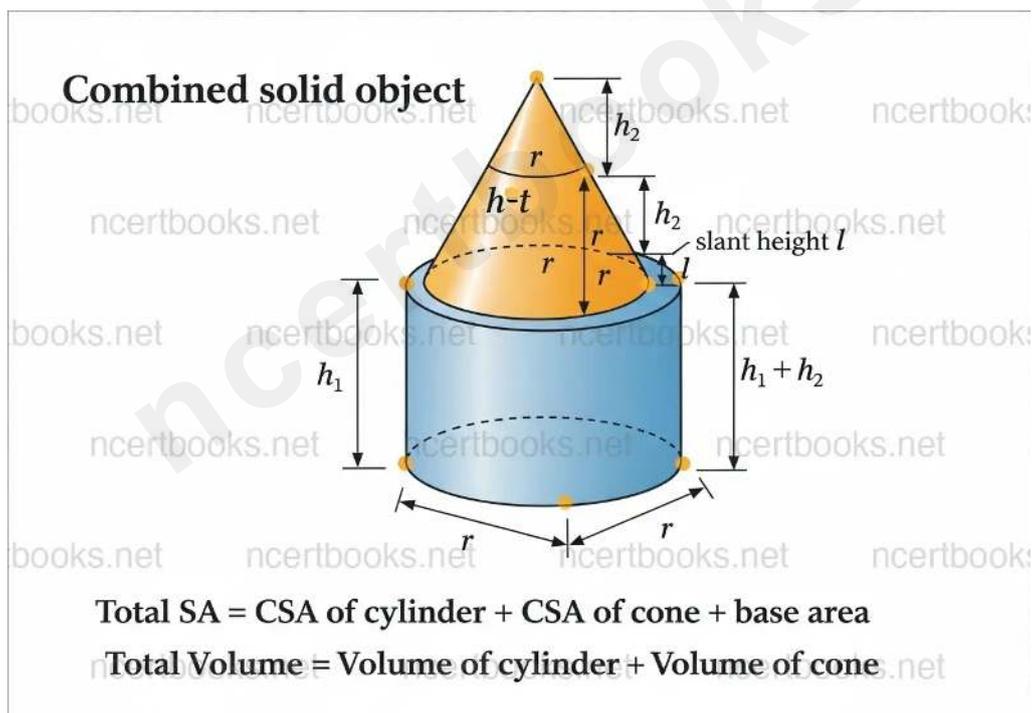


Fig 13.3: Combination solid (cylinder + cone) — add individual surface areas and volumes

Key Concepts and Formulas for Chapter 13 — Surface Areas and Volumes

The central idea of Exercise 13.1 is simple: **Total Surface Area of a combined solid = Sum of the visible surface areas of individual solids.** You must identify which surfaces are exposed (visible) and which are hidden (joined together).

What is a Combination of Solids?

A combination of solids is formed when two or more basic solids are joined together. For example, an ice-cream cone is a cone with a hemisphere on top. A capsule is a cylinder with two hemispheres at each end. In all such cases, the surface area calculation requires care about which parts are visible.

Key Formulas Used in Exercise 13.1

All formulas below use $\pi = 22/7$ unless stated otherwise.

- **Curved Surface Area (CSA) of cylinder:** $2\pi r h$
- **Total Surface Area (TSA) of cylinder:** $2\pi r(r + h)$
- **CSA of cone:** $\pi r l$ where slant height $l = \sqrt{r^2 + h^2}$
- **TSA of cone:** $\pi r(r + l)$
- **CSA of hemisphere:** $2\pi r^2$
- **TSA of hemisphere:** $3\pi r^2$
- **Surface area of sphere:** $4\pi r^2$
- **TSA of cuboid:** $2(lb + bh + hl)$
- **TSA of cube (side a):** $6a^2$

Formula Reference Table — Surface Areas and Volumes Class 10

Formula Name	Formula (LaTeX)	Variables Defined
CSA of Cylinder	$2\pi r h$	$r =$ radius, $h =$ height
TSA of Cylinder	$2\pi r(r+h)$	$r =$ radius, $h =$ height
CSA of Cone	$\pi r l$	$r =$ radius, $l =$ slant height
Slant Height of Cone	$l = \sqrt{r^2 + h^2}$	$r =$ radius, $h =$ vertical height
CSA of Hemisphere	$2\pi r^2$	$r =$ radius
TSA of Hemisphere	$3\pi r^2$	$r =$ radius
Surface Area of Sphere	$4\pi r^2$	$r =$ radius
TSA of Cuboid	$2(lb + bh + hl)$	$l =$ length, $b =$ breadth, $h =$ height
TSA of Cube	$6a^2$	$a =$ side length

NCERT Solutions Exercise 13.1 — NCERT Solutions Class 10th Maths Chapter 13 Surface Areas and Volumes (All 9 Questions)

Below are complete, step-by-step solutions for all 9 questions in Exercise 13.1. These solutions match the official NCERT answer key and are written to help you score full marks in your 2026-27 CBSE board exam. Each solution uses $\pi = 22/7$.

Question 1

Easy

2 cubes each of volume 64 cm^3 are joined end to end. Find the surface area of the resulting cuboid.

Step 1: Find the side of each cube. Volume of cube = $a^3 = 64 \text{ cm}^3$

$$a = \sqrt[3]{64} = 4 \text{ cm}$$

Step 2: When two cubes are joined end to end, the resulting cuboid has dimensions:

Length $l = 4 + 4 = 8 \text{ cm}$, Breadth $b = 4 \text{ cm}$, Height $h = 4 \text{ cm}$

Step 3: Apply the TSA formula for a cuboid:

$$\begin{aligned} \text{TSA} &= 2(lb + bh + hl) \\ &= 2(8 \times 4 + 4 \times 4 + 4 \times 8) \\ &= 2(32 + 16 + 32) \\ &= 2 \times 80 = 160 \text{ cm}^2 \end{aligned}$$

Why does this work? When the cubes are joined, two square faces (each of area $4 \times 4 = 16 \text{ cm}^2$) are hidden inside — they are not part of the outer surface. The formula automatically accounts for this.

∴ Surface area of the resulting cuboid = 160 cm^2

Board Exam Note: This type of question typically appears in 2–3 mark sections. Always show the step of finding the side from the volume before computing TSA.

Question 2

Medium

A vessel is in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.

Key Concept: The inner surface area = CSA of cylinder + CSA of hemisphere (the circular rim where they join is not a surface).

Step 1: Find the dimensions.

Diameter of hemisphere = 14 cm, so radius $r = 7$ cm.

Total height of vessel = 13 cm. Height of hemisphere = radius = 7 cm.

Height of cylinder $h = 13 - 7 = 6$ cm.

Step 2: Calculate CSA of the cylinder:

$$\text{CSA of cylinder} = 2\pi r h = 2 \times \frac{22}{7} \times 7 \times 6 = 264 \text{ cm}^2$$

Step 3: Calculate CSA of the hemisphere:

$$\text{CSA of hemisphere} = 2\pi r^2 = 2 \times \frac{22}{7} \times 7 \times 7 = 308 \text{ cm}^2$$

Step 4: Add both:

$$\text{Inner Surface Area} = 264 + 308 = 572 \text{ cm}^2$$

∴ Inner surface area of the vessel = 572 cm²

Board Exam Note: This question appears in 2–3 mark sections. Do not add the base circle of the cylinder — the vessel is hollow and open at the top.

Question 3

Medium

A toy is in the form of a cone of radius 3.5 cm mounted on a hemisphere of the same radius. The total height of the toy is 15.5 cm. Find the total surface area of the toy.

Step 1: Find the height of the cone.

Total height = 15.5 cm. Height of hemisphere = radius = 3.5 cm.

Height of cone $h = 15.5 - 3.5 = 12$ cm, radius $r = 3.5$ cm.

Step 2: Find the slant height of the cone:

$$l = \sqrt{(r^2 + h^2)} = \sqrt{(3.5)^2 + (12)^2} = \sqrt{(12.25 + 144)} = \sqrt{(156.25)} = 12.5 \text{ cm}$$

Step 3: Total surface area = CSA of cone + CSA of hemisphere (the base circle of the cone coincides with the flat face of the hemisphere — not visible).

$$\text{CSA of cone} = \pi r l = 22/7 \times 3.5 \times 12.5 = 137.5 \text{ cm}^2$$

$$\text{CSA of hemisphere} = 2\pi r^2 = 2 \times 22/7 \times (3.5)^2 = 2 \times 22/7 \times 12.25 = 77 \text{ cm}^2$$

Step 4: Add both:

$$\text{Total Surface Area} = 137.5 + 77 = 214.5 \text{ cm}^2$$

∴ Total surface area of the toy = 214.5 cm²

Board Exam Note: This is a favourite in long answer sections. Always calculate slant height as a separate step and show the formula clearly.

Question 4

Medium

A cubical block of side 7 cm is surmounted by a hemisphere. What is the greatest diameter the hemisphere can have? Find the surface area of the solid.

Step 1: The greatest diameter of the hemisphere = side of the cube = 7 cm. So radius $r = 3.5$ cm.

Step 2: The surface area of the solid = TSA of cube – base circle of hemisphere + CSA of hemisphere.

Why? The hemisphere sits on one face of the cube. The circular base of the hemisphere (area = πr^2) is no longer exposed. We replace it with the curved surface of the hemisphere.

Step 3: Calculate each part:

$$\text{TSA of cube} = 6a^2 = 6 \times 7^2 = 6 \times 49 = 294 \text{ cm}^2$$

$$\text{Area of base circle of hemisphere} = \pi r^2 = 22/7 \times (3.5)^2 = 22/7 \times 12.25 = 38.5 \text{ cm}^2$$

$$\text{CSA of hemisphere} = 2\pi r^2 = 2 \times 38.5 = 77 \text{ cm}^2$$

Step 4: Total surface area:

$$= 294 - 38.5 + 77 = 332.5 \text{ cm}^2$$

∴ Greatest diameter = 7 cm; Surface area of the solid = 332.5 cm²

Board Exam Note: Students often forget to subtract the circular base of the hemisphere from the cube's TSA. This step is critical for full marks.

Question 5

Hard

A hemispherical depression is cut out from one face of a cubical wooden block such that the diameter d of the hemisphere is equal to the edge of the cube. Determine the surface area of the remaining solid.

Step 1: Let the edge of the cube = d . Then radius of hemisphere $r = d/2$.

Step 2: The surface area of the remaining solid consists of:

- 5 complete faces of the cube (the 6th face has the hemispherical depression)
- The 6th face minus the circular opening: $d^2 - \pi r^2$
- The curved inner surface of the hemispherical depression: $2\pi r^2$

Step 3: Calculate:

$$\text{Area of 5 full faces} = 5d^2$$

$$\text{Area of 6th face (with hole)} = d^2 - \pi r^2 = d^2 - \pi (d/2)^2 = d^2 - (\pi d^2)/(4)$$

$$\text{CSA of hemispherical cavity} = 2\pi r^2 = 2\pi (d/2)^2 = (\pi d^2)/(2)$$

Step 4: Add all parts:

$$\text{Total Surface Area} = 5d^2 + d^2 - (\pi d^2)/(4) + (\pi d^2)/(2)$$

$$= 6d^2 + (\pi d^2)/(4)(-1 + 2)$$

$$= 6d^2 + (\pi d^2)/(4)$$

$$= 1/4(24d^2 + \pi d^2) = d^2/4(24 + \pi)$$

∴ Surface area of the remaining solid = $d^2/4(24 + \pi)$

Board Exam Note: This algebraic answer is accepted as the final answer. Do not substitute a numerical value for d . This question often appears in long answer sections.

Question 6

Medium

A medicine capsule is in the shape of a cylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

Step 1: Diameter = 5 mm, so radius $r = 2.5$ mm.

Total length of capsule = 14 mm. Each hemisphere has height = radius = 2.5 mm.

Length of cylindrical part $h = 14 - 2 \times 2.5 = 14 - 5 = 9$ mm.

Step 2: Surface area = CSA of cylinder + $2 \times$ CSA of hemisphere.

Why? The two flat circular ends of the cylinder are covered by the hemispheres — not visible. The two hemisphere bases are also not visible (joined to cylinder). Only the curved surfaces are exposed.

$$\text{CSA of cylinder} = 2\pi r h = 2 \times \frac{22}{7} \times 2.5 \times 9 = \frac{990}{7} \approx 141.43 \text{ mm}^2$$

$$2 \times \text{CSA of hemisphere} = 2 \times 2\pi r^2 = 4\pi r^2 = 4 \times \frac{22}{7} \times (2.5)^2 = 4 \times \frac{22}{7} \times 6.25 = \frac{550}{7} \approx 78.57 \text{ mm}^2$$

Step 3: Total surface area:

$$= \frac{990}{7} + \frac{550}{7} = \frac{(1540)}{(7)} = 220 \text{ mm}^2$$

\therefore Surface area of the medicine capsule = 220 mm²

Board Exam Note: Note that $4\pi r^2$ (two hemispheres) equals the surface area of one complete sphere. This shortcut saves time in exams.

Question 7

Medium

A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. Also, find the cost of the canvas of the tent at the rate of Rs 500 per m². (Note that the base of the tent will not be covered with canvas.)

Step 1: Identify dimensions. Diameter = 4 m, so radius $r = 2$ m. Height of cylinder $h = 2.1$ m. Slant height of cone $l = 2.8$ m.

Step 2: Canvas area = CSA of cylinder + CSA of cone. (Base is not covered.)

$$\text{CSA of cylinder} = 2\pi r h = 2 \times \frac{22}{7} \times 2 \times 2.1 = \frac{(2 \times 22 \times 2 \times 2.1)}{(7)} = \frac{(184.8)}{(7)} = 26.4 \text{ m}^2$$

$$\text{CSA of cone} = \pi r l = \frac{22}{7} \times 2 \times 2.8 = \frac{(22 \times 2 \times 2.8)}{7} = \frac{123.2}{7} = 17.6 \text{ m}^2$$

Step 3: Total canvas area:

$$= 26.4 + 17.6 = 44 \text{ m}^2$$

Step 4: Cost of canvas:

$$\text{Cost} = 44 \times 500 = \text{Rs } 22000$$

∴ Area of canvas = 44 m²; Cost of canvas = Rs 22,000

Board Exam Note: Two-part questions like this appear in long answer sections. Write both the area and cost as separate conclusions to get full marks.

Question 8

Hard

From a solid cylinder whose height is 2.4 cm and diameter 1.4 cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm².

Step 1: Diameter = 1.4 cm, so radius $r = 0.7$ cm. Height $h = 2.4$ cm.

Step 2: Find slant height of the cone:

$$l = \sqrt{(r^2 + h^2)} = \sqrt{((0.7)^2 + (2.4)^2)} = \sqrt{(0.49 + 5.76)} = \sqrt{6.25} = 2.5 \text{ cm}$$

Step 3: The remaining solid has these visible surfaces:

- Curved surface of the cylinder (outer)
- Top circular face of the cylinder (the cone is hollowed from the bottom, so top remains)
- Base circular ring — wait, the cone is removed from the bottom, so the base circle is gone. Actually the cone is hollowed from inside, so the base of the cylinder is the base of the cone — the base circle is still present as a flat ring... but since the cone has the same base, the base of the cylinder is entirely the base of the cone. The bottom face is not there (it's the opening of the cone). So the surfaces are: CSA of cylinder + top circle + CSA of cone (inner curved surface).

Clarification: The cone is hollowed out from the bottom. So the bottom flat face of the cylinder is removed (it becomes the open base of the conical cavity). The visible surfaces are: (1) CSA of cylinder, (2) top circular face of cylinder, (3) inner curved surface of cone (the cavity wall).

$$\text{CSA of cylinder} = 2\pi r h = 2 \times \frac{22}{7} \times 0.7 \times 2.4 = \frac{(2 \times 22 \times 0.7 \times 2.4)}{(7)} = \frac{(73.92)}{(7)} = 10.56 \text{ cm}^2$$

$$\text{Top circle} = \pi r^2 = \frac{22}{7} \times (0.7)^2 = \frac{22}{7} \times 0.49 = \frac{(10.78)}{(7)} = 1.54 \text{ cm}^2$$

$$\text{CSA of cone} = \pi r l = \frac{22}{7} \times 0.7 \times 2.5 = \frac{(38.5)}{(7)} = 5.5 \text{ cm}^2$$

Step 4: Total surface area:

$$= 10.56 + 1.54 + 5.5 = 17.60 \text{ cm}^2 \approx 18 \text{ cm}^2$$

∴ Total surface area of the remaining solid $\approx 18 \text{ cm}^2$

Board Exam Note: The phrase "to the nearest cm^2 " means you must round your answer. Forgetting to round will cost you a mark. Always identify all three surfaces carefully.

Question 9

Hard

A wooden article was made by scooping out a hemisphere from each end of a solid cylinder, as shown in figure. If the height of the cylinder is 10 cm, and its base is of radius 3.5 cm, find the total surface area of the article.

Step 1: Radius of cylinder = radius of each hemisphere = $r = 3.5 \text{ cm}$. Height of cylinder $h = 10 \text{ cm}$.

Step 2: Identify the visible surfaces. Two hemispheres are scooped out from each end. The two flat circular ends of the cylinder are completely removed. Instead, the inner curved surfaces of the two hemispheres are visible.

Visible surfaces:

- Curved surface of the cylinder (lateral surface)
- $2 \times \text{CSA of hemisphere}$ (inner curved surfaces of the two scooped-out hemispheres)

Note: The flat circular ends of the cylinder are NOT visible — they are replaced by the hemispherical cavities.

Step 3: Calculate each:

$$\text{CSA of cylinder} = 2\pi r h = 2 \times \frac{22}{7} \times 3.5 \times 10 = \frac{(2 \times 22 \times 3.5 \times 10)}{(7)} = \frac{(1540)}{(7)} = 220 \text{ cm}^2$$

$$2 \times \text{CSA of hemisphere} = 2 \times 2\pi r^2 = 4\pi r^2 = 4 \times \frac{22}{7} \times (3.5)^2 = 4 \times \frac{22}{7} \times 12.25 = \frac{(1078)}{(7)} = 154 \text{ cm}^2$$

Step 4: Total surface area:

$$= 220 + 154 = 374 \text{ cm}^2$$

∴ Total surface area of the wooden article = 374 cm²

Board Exam Note: This question is a favourite in board exams. Remember: $4\pi r^2$ (two hemispheres) = surface area of one complete sphere. Stating this shortcut in your answer impresses examiners.

Solved Examples Beyond NCERT — Extra Practice for CBSE Class 10 Maths

These extra examples go slightly beyond Exercise 13.1 and are ideal for students targeting full marks in the 2026-27 board exam.

Extra Example 1

Medium

A solid is in the form of a cone mounted on a cylinder. The radius of the base of the cone and the cylinder is 5 cm. The height of the cylinder is 8 cm and the slant height of the cone is 13 cm. Find the total surface area of the solid.

Step 1: $r = 5$ cm, cylinder height $h_c = 8$ cm, cone slant height $l = 13$ cm.

Step 2: Visible surfaces = CSA of cylinder + base circle of cylinder + CSA of cone (base of cone is hidden — it sits on top of cylinder).

$$\text{CSA of cylinder} = 2\pi r h_c = 2 \times \frac{22}{7} \times 5 \times 8 = \frac{1760}{7} \approx 251.43 \text{ cm}^2$$

$$\text{Base of cylinder} = \pi r^2 = \frac{22}{7} \times 25 = \frac{550}{7} \approx 78.57 \text{ cm}^2$$

$$\text{CSA of cone} = \pi r l = \frac{22}{7} \times 5 \times 13 = \frac{1430}{7} \approx 204.29 \text{ cm}^2$$

$$\text{Total} = \left(\frac{1760}{7} + \frac{550}{7} + \frac{1430}{7}\right) = \frac{3740}{7} \approx 534.29 \text{ cm}^2$$

∴ Total surface area $\approx 534.29 \text{ cm}^2$

Extra Example 2

Easy

A sphere of radius 7 cm is mounted on a cylinder of radius 7 cm and height 14 cm. Find the total surface area of the solid (excluding the base of the cylinder).

Step 1: $r = 7$ cm, cylinder height $h = 14$ cm.

Step 2: Visible surfaces = CSA of cylinder + Surface area of sphere – base circle of sphere (where it joins the cylinder).

$$\text{CSA of cylinder} = 2\pi r h = 2 \times 22/7 \times 7 \times 14 = 616 \text{ cm}^2$$

$$\text{Surface area of sphere} = 4\pi r^2 = 4 \times 22/7 \times 49 = 616 \text{ cm}^2$$

$$\text{Base circle} = \pi r^2 = 22/7 \times 49 = 154 \text{ cm}^2$$

$$\text{Total} = 616 + 616 - 154 = 1078 \text{ cm}^2$$

∴ Total surface area = 1078 cm²

Important Questions for Board Exam 2026-27 — NCERT Class 10 Maths Chapter 13

These questions are selected based on past CBSE board exam patterns. Practise all of them before your 2026-27 exam.

1-Mark Questions (Definition / Recall)

1. Write the formula for the curved surface area of a hemisphere of radius r . **Answer:**
 $2\pi r^2$
2. What is the slant height of a cone with radius 6 cm and height 8 cm? **Answer:** $l = \sqrt{(36 + 64)} = 10 \text{ cm}$
3. If two cubes of side 5 cm are joined end to end, what are the dimensions of the resulting cuboid? **Answer:** $10 \text{ cm} \times 5 \text{ cm} \times 5 \text{ cm}$

3-Mark Questions (Application)

1. A solid is made by placing a hemisphere of radius 4 cm on top of a cylinder of the same radius and height 6 cm. Find the total surface area. **Answer:** CSA of cylinder + base of cylinder + CSA of hemisphere = $2\pi(4)(6) + \pi(4)^2 + 2\pi(4)^2 = 48\pi + 16\pi + 32\pi = 96\pi \approx 301.71 \text{ cm}^2$
2. The diameter of a metallic sphere is 6 cm. It is melted and drawn into a wire of diameter 0.2 cm. Find the length of the wire. (This connects Chapter 13 Volume section — good revision.)

5-Mark Questions (Long Answer)

1. A tent is in the shape of a right circular cylinder of height 3 m and radius 3 m, surmounted by a right circular cone of the same radius and slant height 5 m. Find the cost of canvas required at Rs 200 per m². **Answer:** Canvas = CSA of cylinder + CSA of cone = $2\pi(3)(3) + \pi(3)(5) = 18\pi + 15\pi = 33\pi \approx 103.71 \text{ m}^2$. Cost = $103.71 \times 200 \approx \text{Rs } 20,742$.

Common Mistakes Students Make in Chapter 13 Surface Areas and Volumes

These are the most frequent errors seen in CBSE board answer sheets. Fix these before your 2026-27 exam.

Mistake 1: Students add the *total* surface area of each solid instead of only the visible parts.

Why it's wrong: The joined/hidden faces must not be counted — they are inside the solid.

Correct approach: Identify which faces are exposed and add only those.

Mistake 2: Students forget to subtract the circular base of the hemisphere when it sits on a cube or cylinder.

Why it's wrong: That circle is hidden — it is the junction between the two solids.

Correct approach: TSA of cube – base circle of hemisphere + CSA of hemisphere.

Mistake 3: Students use diameter instead of radius in formulas.

Why it's wrong: All standard surface area formulas use radius r , not diameter d .

Correct approach: Always divide the given diameter by 2 before substituting.

Mistake 4: Students forget to calculate slant height and use vertical height in the cone CSA formula.

Why it's wrong: The formula $\pi r l$ requires slant height l , not vertical height h .

Correct approach: Always compute $l = \sqrt{r^2 + h^2}$ as a separate step.

Mistake 5: In Question 8, students include the base circle of the cylinder in the total surface area even though the cone is hollowed from the bottom.

Why it's wrong: The base of the cylinder is removed when the cone is hollowed out.

Correct approach: Include CSA of cylinder + top circle + CSA of cone (inner surface).

Exam Tips for 2026-27 CBSE Board — Chapter 13 Surface Areas and Volumes

Use these tips when preparing for your 2026-27 CBSE Class 10 board exam:

- **Show all formula steps:** The CBSE 2026-27 marking scheme awards 1 mark for writing the correct formula. Never skip it.
- **Use $\pi = 22/7$:** Unless the question specifies otherwise, always use $22/7$. Using 3.14 may give slightly different answers and cost marks.
- **Draw a rough diagram:** A quick sketch of the combined solid helps you identify visible surfaces. Examiners award marks for correct diagrams.
- **Label intermediate answers:** Write "CSA of cylinder = ..." and "CSA of cone = ..." as separate lines. This helps you get partial marks even if the final answer is wrong.

- **Round correctly:** When the question says "to the nearest cm²", you must round. Leaving an unrounded decimal answer loses the final mark.
- **Chapter weightage:** Mensuration (including Chapter 13) typically carries 10–12 marks in the CBSE Class 10 board paper. Mastering Exercise 13.1 can secure you 5–6 marks directly.

Key Points to Remember — NCERT Class 10 Maths Chapter 13

- Surface area of a combination = sum of **visible** surface areas only
- Always find slant height $l = \sqrt{r^2 + h^2}$ before using cone CSA formula
- Two hemispheres together = one complete sphere: $2 \times 2\pi r^2 = 4\pi r^2$
- When a hemisphere is placed on a cube: subtract one πr^2 from cube TSA and add $2\pi r^2$
- When a hemisphere is *scooped out*: subtract πr^2 from the face and add $2\pi r^2$ (inner curved surface)
- For the capsule shape (cylinder + 2 hemispheres): cylinder length = total length – $2r$
- Use $\pi = 22/7$ for clean calculations in all Exercise 13.1 questions

For more CBSE Class 10 Maths solutions, visit our [NCERT Solutions for Class 10](#) hub. You can also explore all chapters under [NCERT Solutions](#) for every class and subject.

Frequently Asked Questions — Surface Areas and Volumes Class 10 NCERT

How do you find the surface area of a combination of solids in Class 10 Maths?

To find the surface area of a combination of solids, you add the visible curved or flat surface areas of each individual solid. Do not count the surfaces that are joined or hidden inside. For example, when a cone sits on a hemisphere, you add the CSA of the cone and the CSA of the hemisphere only — the circular base where they join is not counted. This is the core concept of Exercise 13.1.

What are the key formulas needed for Chapter 13 Exercise 13.1 Class 10 Maths?

The key formulas are: CSA of cylinder = $2\pi rh$, CSA of cone = πrl where $l = \sqrt{r^2+h^2}$, CSA of hemisphere = $2\pi r^2$, TSA of hemisphere = $3\pi r^2$, Surface area of sphere = $4\pi r^2$, TSA of cuboid = $2(lb+bh+hl)$, and TSA of cube = $6a^2$. Memorise all these formulas before your board exam.

How many questions are in NCERT Class 10 Maths Chapter 13 Exercise 13.1?

Exercise 13.1 of NCERT Class 10 Maths Chapter 13 Surface Areas and Volumes contains exactly 9 questions. All 9 questions involve finding the surface area of combinations of two or more solid shapes — such as cylinders with cones, cylinders with hemispheres, cubes with hemispheres, and capsule-shaped objects. All 9 solutions are provided in full detail above.

Is Chapter 13 Surface Areas and Volumes in the current CBSE syllabus for 2026-27?

Yes, Surface Areas and Volumes is fully included in the current CBSE Class 10 Maths syllabus for 2026-27. Exercise 13.1 on surface areas of combination of solids is part of the rationalised syllabus. The Mensuration unit (which includes Chapter 13) typically carries 10–12 marks in the CBSE board paper, making it one of the most important chapters to master.

What is the total surface area of a toy made of a cone mounted on a hemisphere (Question 3)?

For Question 3, the toy has a cone of radius 3.5 cm on a hemisphere of the same radius, total height 15.5 cm. The cone height = $15.5 - 3.5 = 12$ cm. Slant height $l = \sqrt{12^2 + 3.5^2} = 12.5$ cm. Total surface area = CSA of cone + CSA of hemisphere = $\pi \times 3.5 \times 12.5 + 2\pi \times 3.5^2 = 137.5 + 77 = 214.5 \text{ cm}^2$.

Source: ncertbooks.net — Updated for CBSE Academic Year 2026-27