

4.1.99 Independent transfer: Foundation then Higher

Name: _____ Class: _____ Date: _____

KEY WORDS frustum • cyclic quadrilateral

<!-- Session 2 independent transfer -->

Objective

Apply this topic to unfamiliar Foundation and Higher problems; keep the two scopes distinct. Original questions and local marking guidance.

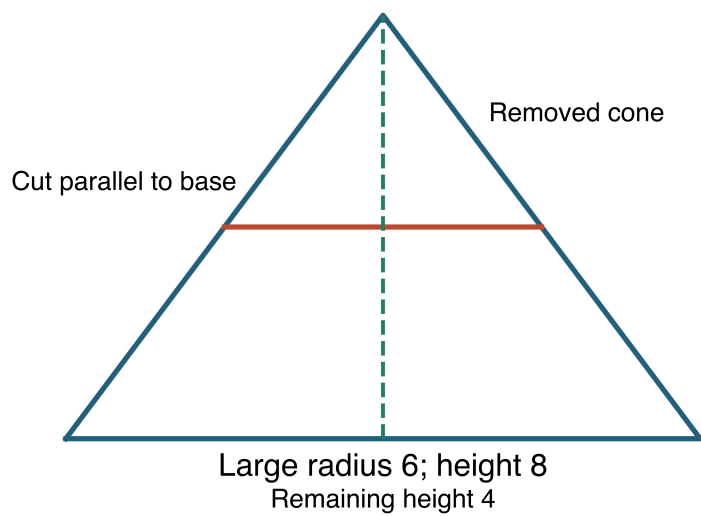
1 Key knowledge and worked examples

A cylinder has volume base area times perpendicular height. Convert cubic centimetres to litres after calculating capacity. Pythagoras requires a right angle. Circle-angle proofs use the diameter or the tangent and chord stated in the problem; specify which of two supplementary tangent angles is requested.

A cone with radius 3 cm and perpendicular height 4 cm has slant height 5 cm. Volume is $12\pi \text{ cm}^3$, curved area $15\pi \text{ cm}^2$ and total closed area $24\pi \text{ cm}^2$. A sphere of radius 3 has volume $36\pi \text{ cm}^3$ and area $36\pi \text{ cm}^2$, with different units. A square pyramid of base side 6 and height 4 has volume $6^2 \times 4 / 3 = 48 \text{ cm}^3$; each triangular face has slant height $\sqrt{(4^2 + 3^2)} = 5$, so lateral area is $4 \times (6 \times 5 / 2) = 60 \text{ cm}^2$ and total area 96 cm^2 . A large cone $r=6, h=8$ loses a similar top cone $r=3, h=4$: frustum volume is $96\pi - 12\pi = 84\pi \text{ cm}^3$. Its slant height is $10 - 5 = 5$; curved area is $60\pi - 15\pi = 45\pi$, and two circular ends add $36\pi + 9\pi$ for total $90\pi \text{ cm}^2$.

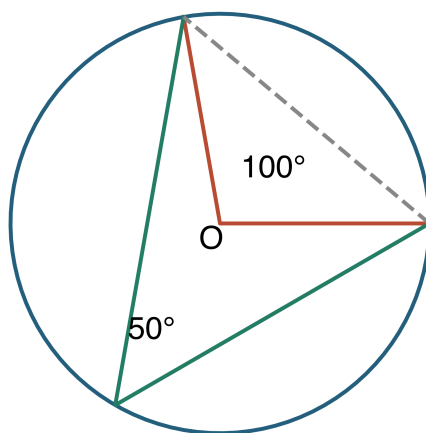
If a central angle is 100° , the corresponding angle at the circumference is 50° . In a cyclic quadrilateral with one angle 112° , its opposite angle is $180 - 112 = 68^\circ$. A radius meeting a tangent gives 90° , even if the drawing looks oblique.

Frustum volume = whole cone – removed similar cone



Prerequisite example; use the transfer task's own data.

The centre angle is twice the circumference angle



Prerequisite example; use the transfer task's own data.

2 Practice

2.1 Foundation: A cylindrical container has internal radius 3 cm and height 10 cm. Find its capacity in cubic centimetres and litres. A rectangular face is 6 cm by 8 cm; find its diagonal, naming the condition for your method.

3 Exam-style questions

3.1 Higher: In a circle, AB is a diameter and C lies elsewhere on the circumference. Angle CAB is 32 degrees. Find angles ACB and ABC. Find the acute angle between the tangent at A and AC, explaining the circle theorem and which side of the tangent you mean.
