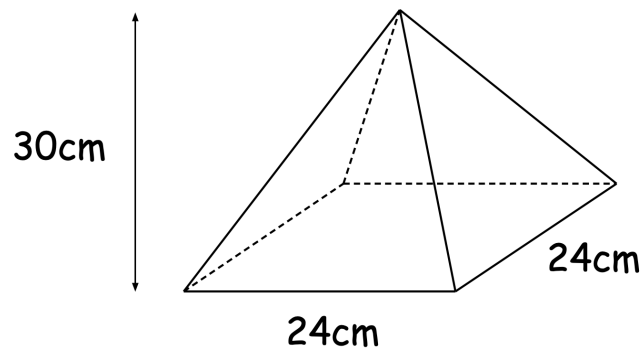


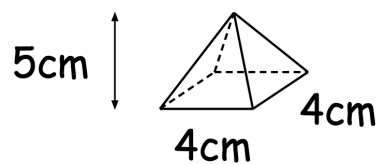
1. Shown is a square based pyramid, A.



- (a) Find the volume of A

.....cm³
(2)

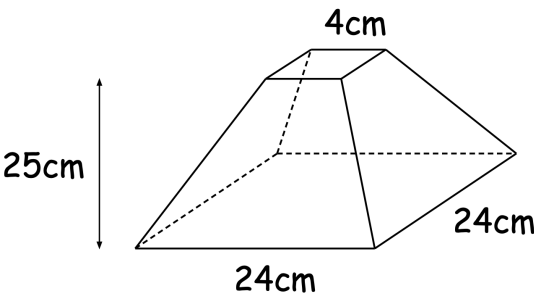
Shown is a smaller square based pyramid, B.



- (b) Find the volume of B

.....cm³
(2)

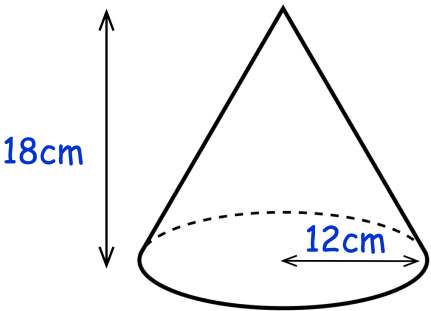
A frustum is created by removing the pyramid B from the top of pyramid A.



(c) Find the volume of the frustum.

.....cm³
(1)

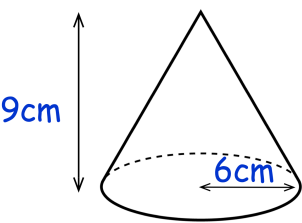
2. Shown below is cone A.



(a) Find the volume of A

.....cm³
(2)

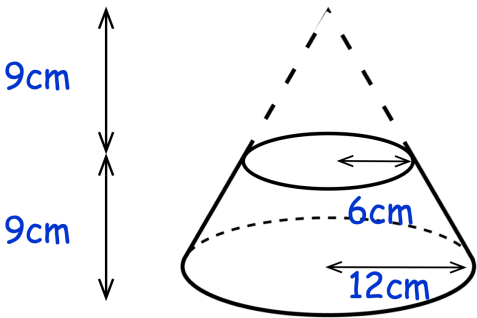
Shown is a smaller cone, B.



(b) Find the volume of B

.....cm³
(2)

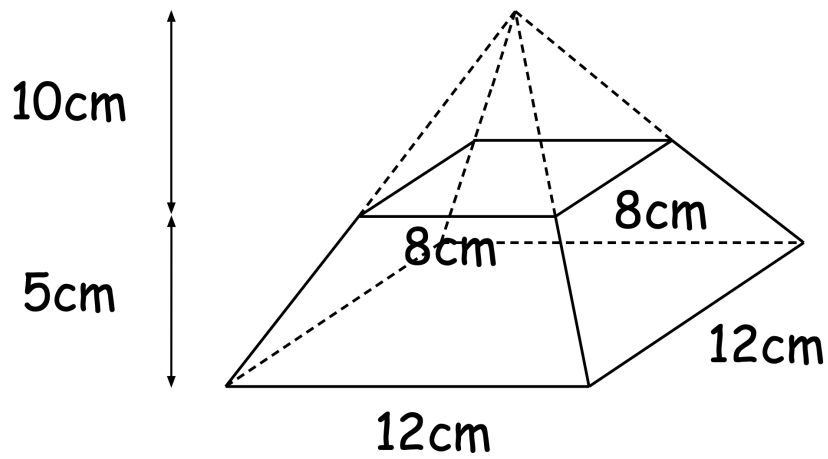
A frustum is created by removing the cone B from the top of cone A.



(c) Find the volume of the frustum.

.....cm³
(1)

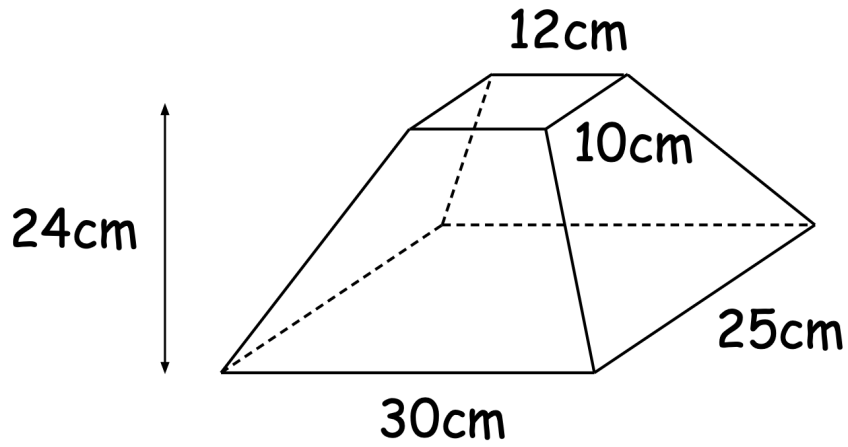
3. A frustum is made by removing a small pyramid from a larger pyramid.



Find the volume of the frustum.

.....cm³
(4)

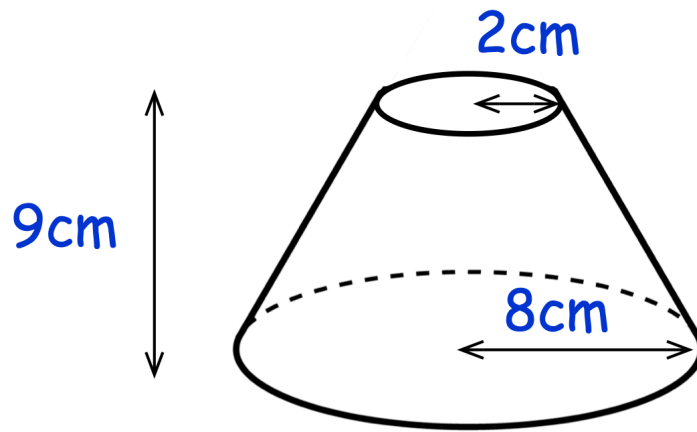
4. Shown is a frustum of a pyramid that had a perpendicular height of 40cm.



Find the volume of the frustum.

.....cm³
(4)

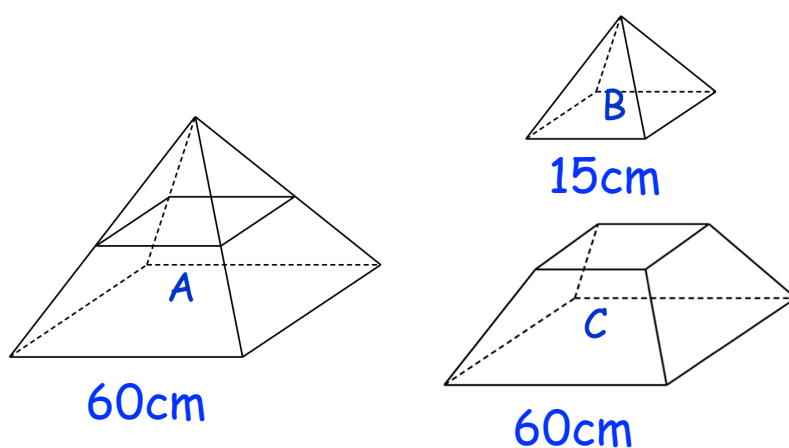
5. Shown is a frustum of a cone that had a perpendicular height of 12cm.



Find the volume of the frustum.

.....cm³
(4)

12. Squared based pyramid A is divided into pyramid B and frustum C.

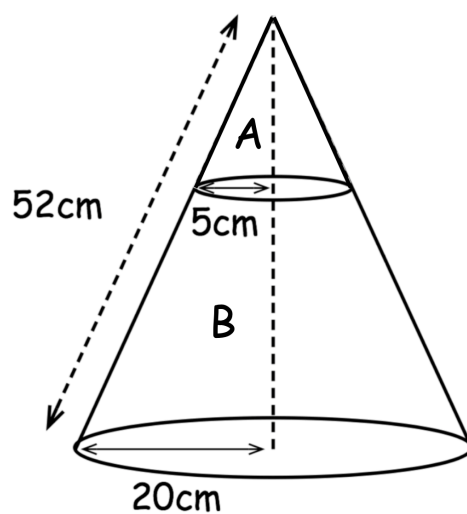


Express the volume of Frustum C as a fraction of the volume of pyramid A.

Give your answer in its simplest form.

.....
(3)

14. Anna made a solid conical ornament.



The top of the ornament, A, is made from aluminium and the bottom of the ornament, B, is made from zinc.

The density of the aluminium is 2.7g/cm^3

The density of the zinc is 7.1g/cm^3

Find the mass of the sculpture.

Include suitable units.

- 16 A frustum is made by removing a small cone from a large cone.
The cones are mathematically similar.

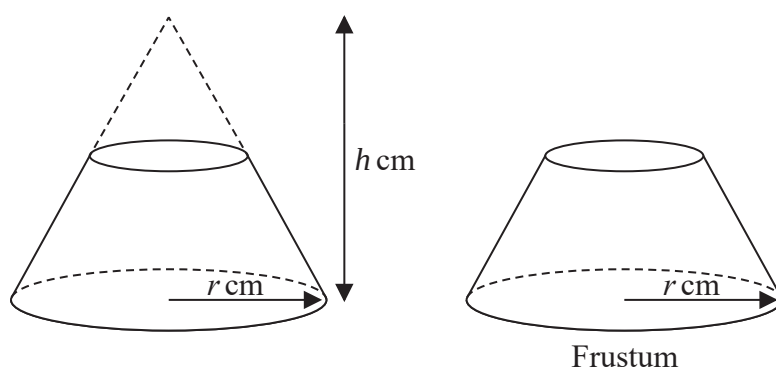


Diagram **NOT**
accurately drawn

The large cone has base radius r cm and height h cm.

Given that

$$\frac{\text{volume of frustum}}{\text{volume of large cone}} = \frac{98}{125}$$

find an expression, in terms of h , for the height of the frustum.

..... cm

(Total for Question 16 is 4 marks)



20 The diagram shows a frustum of a cone and a sphere.

The frustum is made by removing a small cone from a large cone.
The cones are similar.

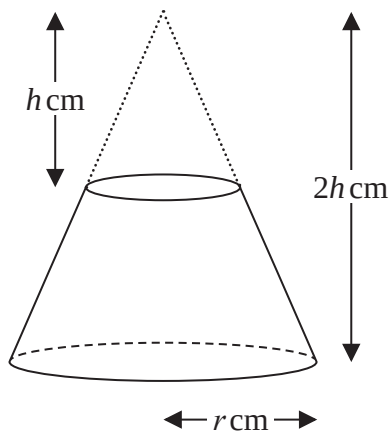
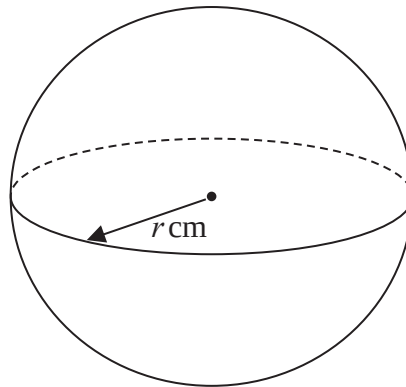


Diagram **NOT**
accurately drawn



The height of the small cone is h cm.
The height of the large cone is $2h$ cm.
The radius of the base of the large cone is r cm.

The radius of the sphere is r cm.

Given that the volume of the frustum is equal to the volume of the sphere,

find an expression for r in terms of h .

Give your expression in its simplest form.

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24 The diagram shows a frustum of a cone, and a sphere.

The frustum, shown shaded in the diagram, is made by removing the small cone from the large cone.

The small cone and the large cone are similar.

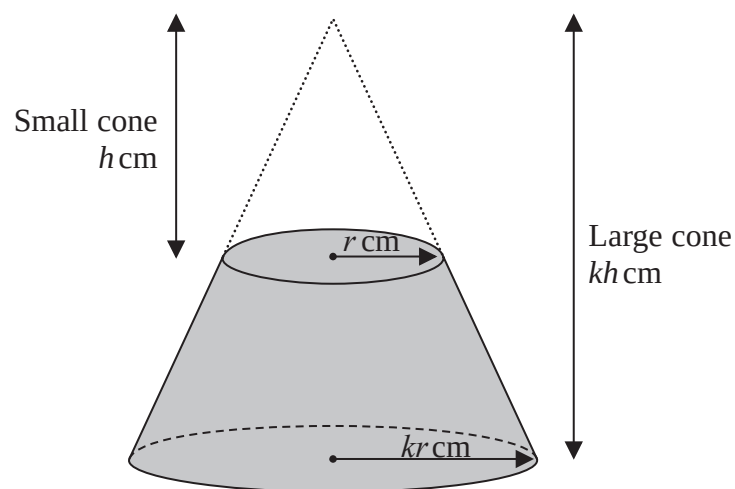
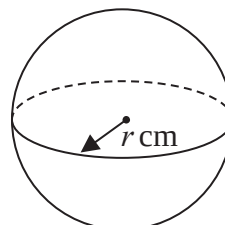


Diagram **NOT** accurately drawn



The height of the small cone is h cm and the radius of the base of the small cone is r cm.
The height of the large cone is kh cm and the radius of the base of the large cone is kr cm.
The radius of the sphere is r cm.

The sphere is divided into two hemispheres, each of radius r cm.

Solid **A** is formed by joining one of the hemispheres to the frustum.

The plane face of the hemisphere coincides with the upper plane face of the frustum, as shown in the diagram below.

Solid **B** is formed by joining the other hemisphere to the small cone that was removed from the large cone.

The plane face of the hemisphere coincides with the plane face of the base of the small cone, as shown in the diagram below.

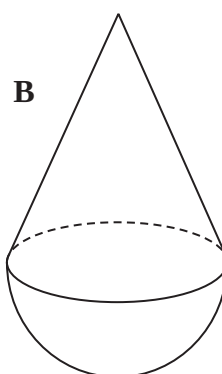
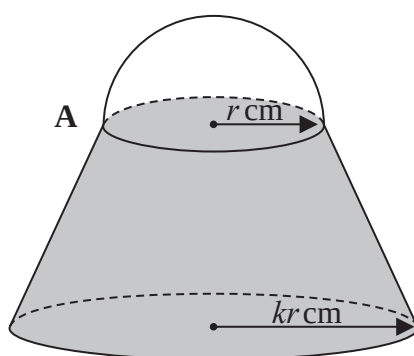


Diagram **NOT** accurately drawn



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The volume of solid **A** is 6 times the volume of solid **B**.

Given that $k > \sqrt[3]{7}$

find an expression for h in terms of k and r

$h = \dots\dots\dots$

(Total for Question 24 is 6 marks)



P 6 8 7 9 1 A 0 2 7 2 8