

Name: _____

Exam Style Questions



Volume of a Pyramid

Corbettmaths

Ensure you have: Pencil, pen, ruler, protractor, pair of compasses and eraser

You may use tracing paper if needed

Guidance

1. Read each question carefully before you begin answering it.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

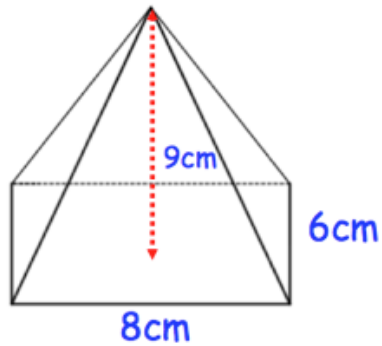
Revision for this topic

www.corbettmaths.com/contents

Video 360



1. A rectangular-based pyramid is shown below.



Calculate the volume of the pyramid.

$$\frac{1}{3}(8 \times 6) \times 9$$
$$= 144$$

$$\underline{144} \text{ cm}^3$$

(2)

2. A square-based pyramid has a base with side length 15 cm. The perpendicular height of the pyramid is 10 cm.

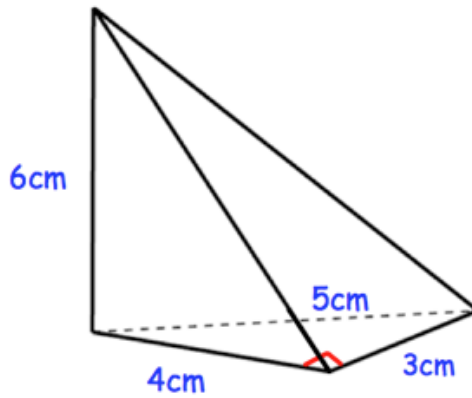
Calculate the volume of the pyramid.

$$\frac{1}{3}(15 \times 15) \times 10$$
$$= 750$$

$$\underline{750} \text{ cm}^3$$

(2)

3. A triangular-based pyramid is shown below.



Calculate the volume of the pyramid.

$$\frac{1}{3} \left(\frac{1}{2} \times 4 \times 3 \right) \times 6$$
$$= 12$$

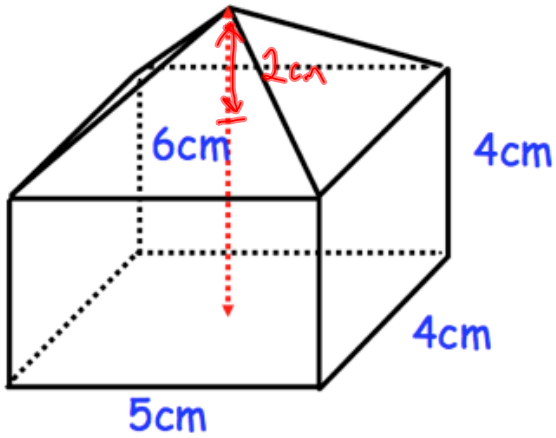
.....cm³
12
(2)

4. Calculate the volume of a pyramid having a square base of side 12cm and perpendicular height of 14cm.

$$\frac{1}{3} (12 \times 12) \times 14$$

.....cm³
672
(2)

5. Shown is a solid that is made of a pyramid and a cuboid.



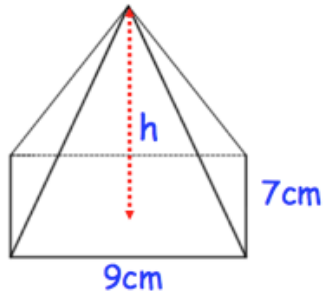
Calculate the volume of the solid.

$$\begin{aligned} \text{Cuboid: } & 5 \times 4 \times 4 = 80 \text{ cm}^3 \\ \text{Pyramid: } & \frac{1}{3}(5 \times 4) \times 2 = 13\frac{1}{3} \text{ cm}^3 \end{aligned}$$

$$93\frac{1}{3} \text{ (93.333...)} \text{ cm}^3$$

(3)

6. Shown is a pyramid with volume 126cm^3

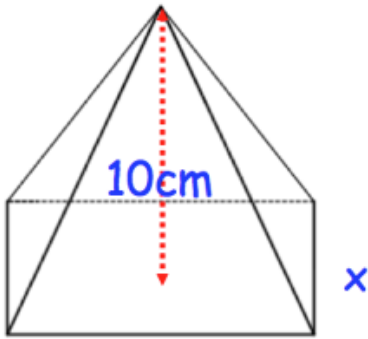


Work out the vertical height.

$$V = \frac{1}{3} (9 \times 7) \times h$$
$$126 = \frac{1}{3} (9 \times 7) \times h$$
$$378 = (9 \times 7) \times h$$
$$h = 6$$

.....6.....cm
(3)

7. Shown is a square-based pyramid with volume 270cm^3



Find the length of the side marked x.

$$\frac{1}{3}(x \times x) \times 10 = 270$$

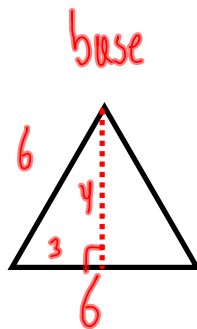
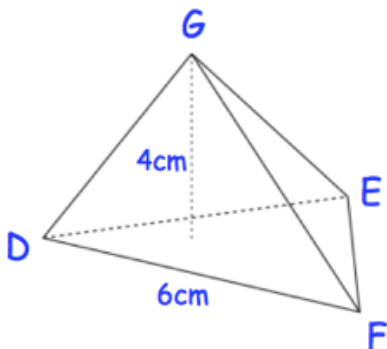
$$x^2 \times 10 = 810$$

$$x^2 = 81$$

$$x = 9$$

.....cm
(3)

8. DEFG is a triangle based pyramid.
 The base DEF is an equilateral triangle with side 6cm.
 The perpendicular height of the pyramid is 4cm.



$$3^2 + y^2 = 6^2$$

$$y^2 = 27$$

$$y = \sqrt{27}$$

Calculate the volume of the pyramid.

$$\frac{1}{3} \left(\frac{1}{2} \times 6 \times \sqrt{27} \right) \times 4$$

$$= \frac{1}{3} (3\sqrt{27}) \times 4$$

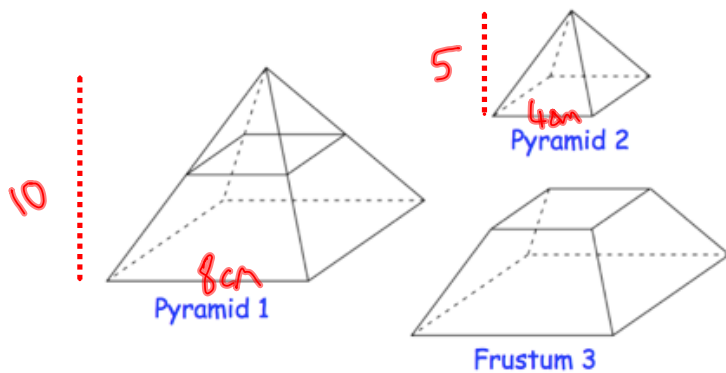
$$= \sqrt{27} \times 4$$

$$= 4\sqrt{27} = 12\sqrt{3} = 20.7846\dots$$

$$12\sqrt{3} / 20.78$$

.....cm³
 (4)

9. A square based pyramid 1 is divided into two parts: a square based pyramid 2 and a frustum 3, as shown.



Pyramid 1 has a base of side length 8cm.
 Pyramid 2 has a base of side length 4cm.
 The perpendicular height of pyramid 1 is 10cm.

Calculate the volume of frustum 3.

$$\text{Pyramid 1: } \frac{1}{3}(8 \times 8) \times 10 = 213\frac{1}{3} \text{ cm}^3$$

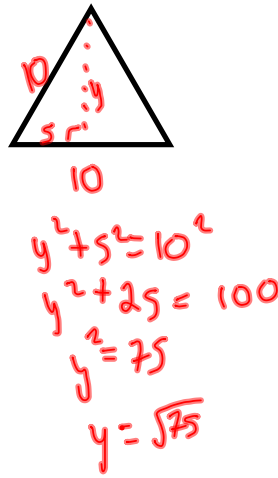
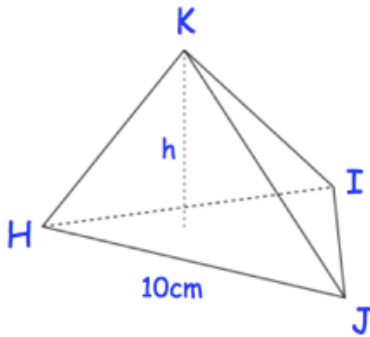
$$\text{Pyramid 2: } \frac{1}{3}(4 \times 4) \times 5 = 80\frac{1}{3}$$

$$213\frac{1}{3} - 80\frac{1}{3} = 133$$

$$\dots\dots\dots 133 \dots\dots\dots \text{cm}^3$$

(4)

10. HIJK is a triangle based pyramid.
 The base HIJ is an equilateral triangle with side 10cm.
 The volume of the pyramid is 300cm^3 .



Calculate the perpendicular height, h , of the pyramid.

$$\begin{aligned}
 V &= \frac{1}{3} \left(\frac{1}{2} \times 10 \times \sqrt{75} \right) \times h \\
 300 &= \frac{1}{3} \left(\frac{1}{2} \times 10 \times \sqrt{75} \right) \times h \\
 900 &= \frac{1}{2} \times 10 \times \sqrt{75} \times h \\
 1800 &= 10 \times \sqrt{75} \times h \\
 180 &= \sqrt{75} \times h \\
 h &= 12\sqrt{3} \text{ or } 20.78\text{cm}
 \end{aligned}$$

.....cm
 (4)