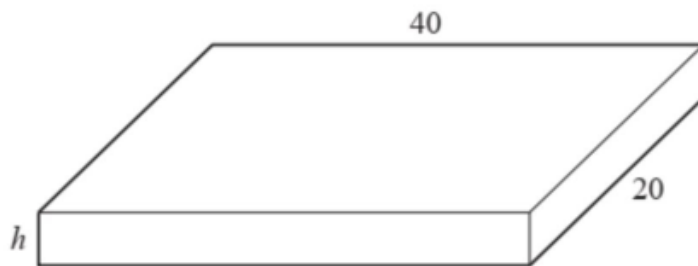




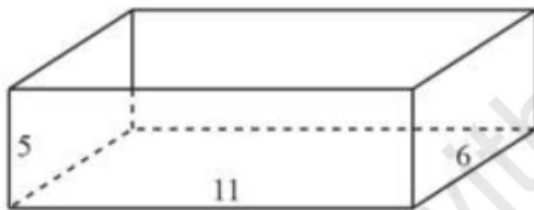
1. A paving slab is a cuboid with length 40 cm, width 20 cm and depth h cm. Its volume is 2400 cm^3 .



- (a) Find the value of h . [1]
 (b) Calculate the volume of concrete needed to make 1000 of these slabs. Give your answer in m^3 . [1]

4024/11/M/J/18 Q20

2. An **open** rectangular tray has inside measurements



length 11cm width 6cm height 5cm.

- (a) Calculate the total surface area of the four sides and base of the inside of the tray. [2]
 (b) Cubes are placed in the tray and a lid is placed on top. Each cube has an edge of 2 cm. Find the maximum number of cubes that can be placed in the tray. [1]

4024/12/O/N/17 Q18)

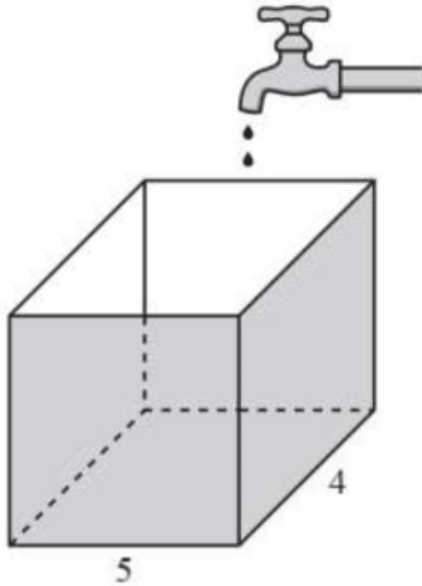
3. Two cubes have a total volume of 152 cm^3 . One cube has an edge of length 5 cm.

- (a) Calculate the length of the edge of the other cube. [2]
 (b) Work out the **total** length of all of the edges of the larger cube. [1]

4024/11/M/J/22 Q4)



4. Water drips from a tap into a container which stands on a horizontal surface.



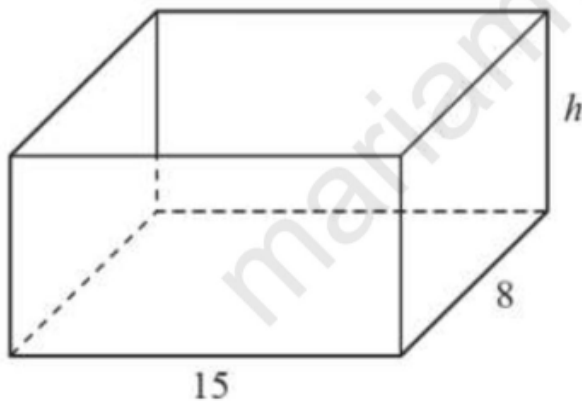
The container is a cuboid with base 5 cm by 4 cm.

The volume of **each** drop of water is 0.08 cm^3 .

Calculate the change in water level caused by 400 drops. [3]

4024/12/O/N/19 Q22)

5. A container is made out of thin material in the shape of a cuboid with an open top.



The container has length 15cm and width 8cm.

The volume of the container is 720 cm^3 .

(a) Calculate the height, h cm, of the container. [2]

(b) Calculate the surface area of the **outside** of the container. [2]

(c) Liquid is poured into the container. The liquid fills 60% of the container.

Calculate the height of the liquid in the container. [1]

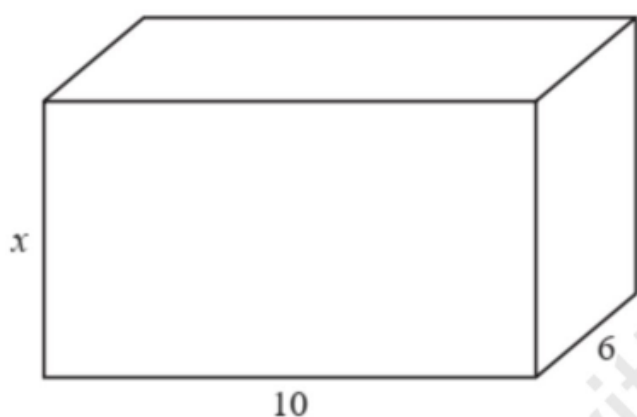
4024/12/M/J/17 Q22)



6. A cuboid has a square base.
The length of the base of the cuboid is y cm.
The height of the cuboid is twice the length of its base.
The total surface area of the cuboid is 360 cm^2 .
Find the height of the cuboid. [3]

4024/12/M/J/19 Q21)

7. The diagram shows a solid cuboid with base 10 cm by 6 cm.
The height of the cuboid is x centimetres.



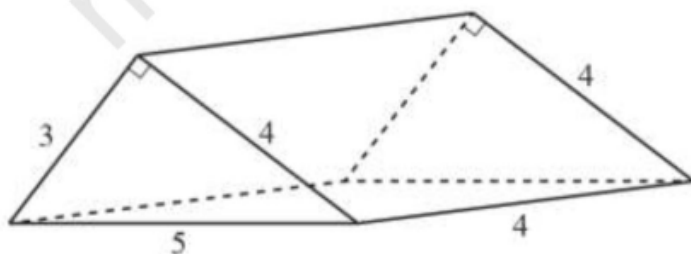
(a) Find an expression, in terms of x , for the total surface area of the cuboid. [1]

(b) The total surface area of the cuboid is 376 cm^2 .

Form an equation in x and solve it to find the height of the cuboid. [2]

4024/01/M/J/08 Q7)

8. The diagram shows a triangular prism.
The measurements are in centimetres.

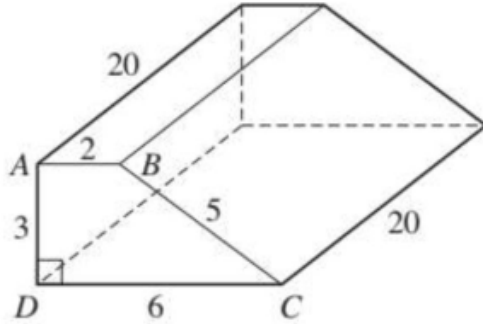


Find the total surface area of the prism [2]

4024/12/O/N/18 Q14



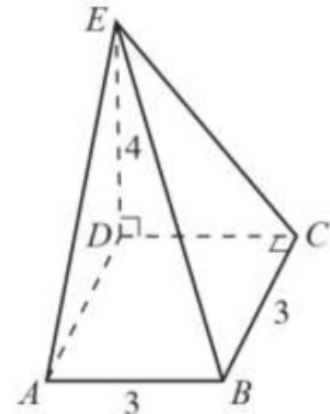
9. The diagram shows a solid prism of length 20 cm.
The cross-section, $ABCD$, is a trapezium.
 $AB = 2$ cm, $BC = 5$ cm, $CD = 6$ cm,
 $DA = 3$ cm and angle $ADC = 90^\circ$.



- (a) Calculate the area of trapezium $ABCD$. [1]
(b) Calculate the **total** surface area of the prism. [2]
4024/11/O/N/11 Q16)

10. The base of a pyramid is a rectangle 9cm by 12cm.
The perpendicular height of the pyramid L is 30cm.
Work out the volume of pyramid. [1]
4024/11/M/J/17 Q15(a)

11. The diagram shows a pyramid.
The square base, $ABCD$, has an edge of 3cm.
The base is horizontal, and vertex E is
vertically above D , where $ED = 4$ cm.
Calculate the total surface area of the pyramid. [3]
4024/12/M/J/18 Q17 (b)





12. $ABCDE$ is a pyramid.

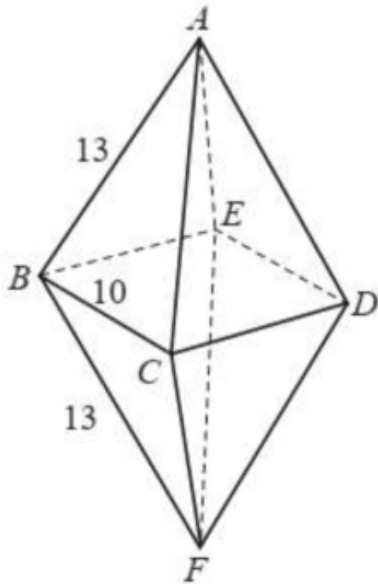
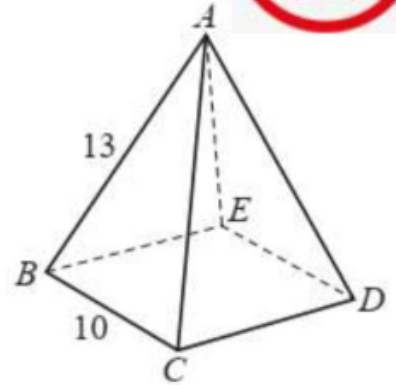
The base $BCDE$ is a square of side 10 cm.

The sloping faces are isosceles triangles.

$$AB = AC = AD = AE = 13 \text{ cm.}$$

(a) Calculate the area of the sloping face ABC . [2]

(b) The pyramid $ABCDE$ is joined to an identical pyramid $BCDEF$ to form the solid $ABCDEF$.



Calculate the surface area of the solid $ABCDEF$. [1]

4024/01/M/J/05 Q19(a) 60 (b)(i) 480

13. Cone 1 has radius $2x$ cm and height $7x$ cm.

Cone 2 has radius x cm and height $4x$ cm.

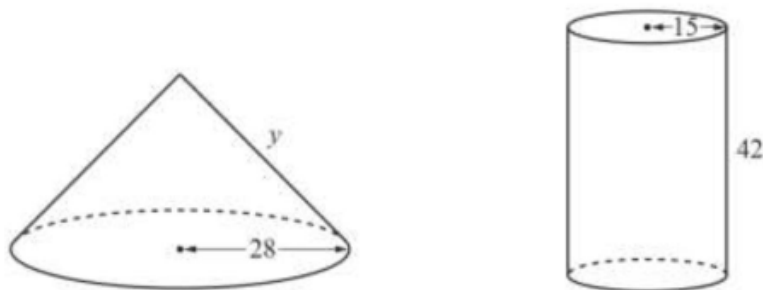
Find an expression, in terms of π and x , for the **difference** in the volume of the two cones.

Give your answer in its simplest form. [3]

4024/11/O/N/13 Q19)



14. The diagram shows a cone and a cylinder



The cone has radius 28cm and slant height y cm.
The cylinder has radius 15cm and height 42cm.
The curved surface area of the cone and the cylinder are equal.
Find the value of y . [3]

4024/11/M/J/20 Q24)

15. A solid cone has radius y cm.

The slant height of the cone is 25% larger than the radius of the cone.

A solid sphere has radius R cm.

The surface area of the sphere is equal to the total surface area of the cone.

(a) Show that $y = \frac{4R}{3}$. [3]

(b) Find the volume of the cone in terms of R .

Give your answer as simply as possible [4]

4024/11/O/N/22 Q23)

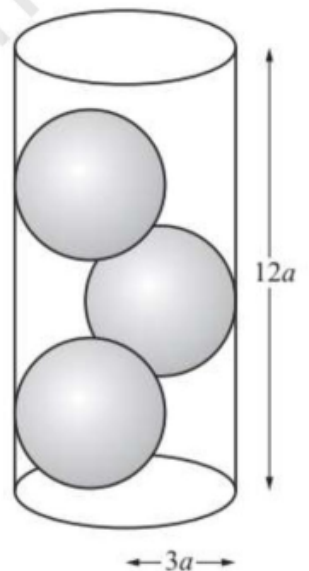


16. 20 spheres, each of radius 3 cm, have a total volume of $k\pi\text{cm}^3$.
- (a) Find the value of k . [1]
- (b) The spheres are inside an open cylinder, with radius 6 cm. The cylinder stands on a horizontal surface and contains enough water to cover the spheres. Calculate the change in depth of the water when the spheres are taken out of the cylinder. [2]

4024/12/O/N/14 Q15)

17. Three spheres, each of radius $2a$ cm are placed inside a cylinder of radius $3a$ cm and height $12a$ cm.
- Water is poured into the cylinder to fill it completely.
- The volume of water is $k\pi a^3 \text{ cm}^3$.
- Find the value of k .

4024/12/O/N/13 Q16)

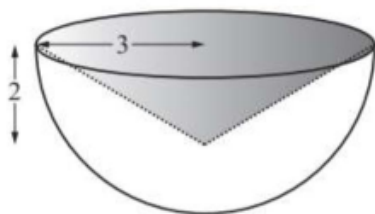


18. During a storm, raindrops fall into a cylinder which stands on horizontal ground.
- The cylinder was empty before the storm started.
- The cylinder has radius 20mm.
- Each raindrop is a sphere of radius 2mm.
- After the storm, the depth of water in the cylinder is 16mm.
- Calculate the number of raindrops that fell into the cylinder. [3]

4024/12/O/N/16 Q21)



19. A cone is removed from a solid wooden hemisphere of radius 3 cm.



The cone has radius 3 cm and height 2 cm.

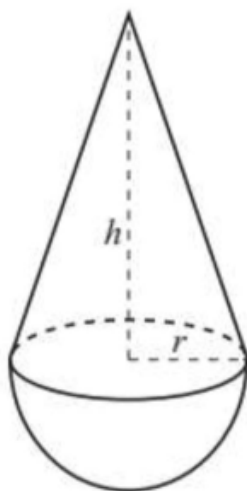
The volume of wood remaining is $k\pi\text{cm}^3$.

Find k . [3]

4024/11/M/J/16 Q14)

20. The solid is formed from a hemisphere of radius r cm fixed to a cone of radius r cm and height h cm.

The volume of the hemisphere is one third of the volume of the solid.



(a) Find h in terms of r . [2]

(b) The slant height of the cone can be written as $r\sqrt{k}$ cm, where k is an integer. Find the value of k . [2]

(c) Find an expression, in terms of r and π , for the total surface area, in cm^2 , of the solid.

Answer cm^2 [1]

4024/12/M/J/15 Q24)

Answers

Q1) (a)3 (b) 2.4	Q11) 36
Q2) (a) 236 (b) 30	Q12) 480
Q3) (a)3 (b) 60	Q13) $8\pi x^3$
Q4) 1.6	Q14) 45
Q5) (a)6 (b)396 (c) 3.6	Q15) (b) $\frac{16\pi R^3}{27}$
Q6) 12	Q16) (a)720 (b) 20
Q7) (a) $32x + 120$ (b) 8	Q17) 76
Q8) (b)60	Q18) 600
Q9) (a)12 (b) 344	Q19) 12
Q10) 1080	Q20) (a)4r (b)17 (c) $\pi r^2(2 + \sqrt{17})$