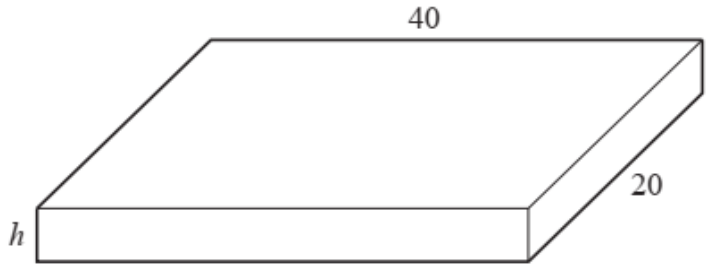
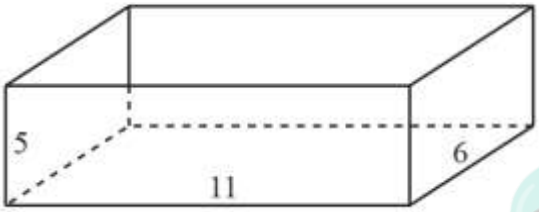
1. A paving slab is a cuboid with length 40 cm, width 20 cm and depth h cm.
Its volume is 2400 cm^3.



(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

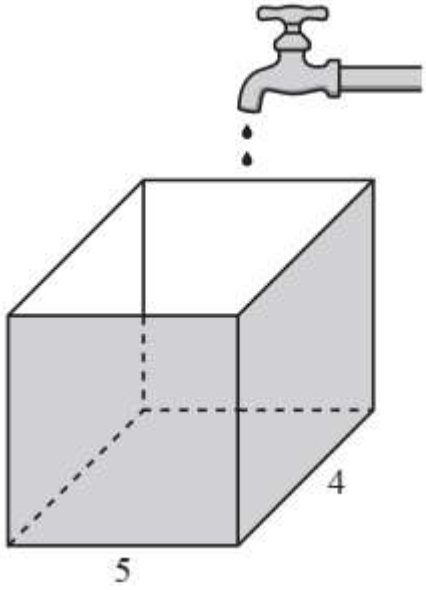


length 11cm width 6cm height 5cm.
(a) Calculate the total surface area of the four sides and base of the inside of the tray. [2]
(b) Cubes are placed in the tray and a lid is placed on top.
Each cube has an edge of 2 cm. Find the maximum number of cubes that can be placed in the tray. [1]
4024/12/O/N/17 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)

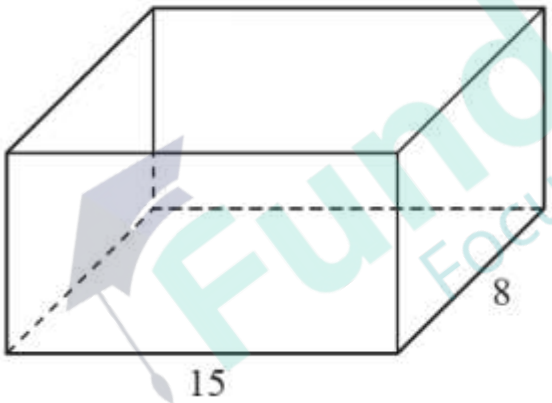
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4. Water drips from a tap into a container which stands on a horizontal surface.



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.



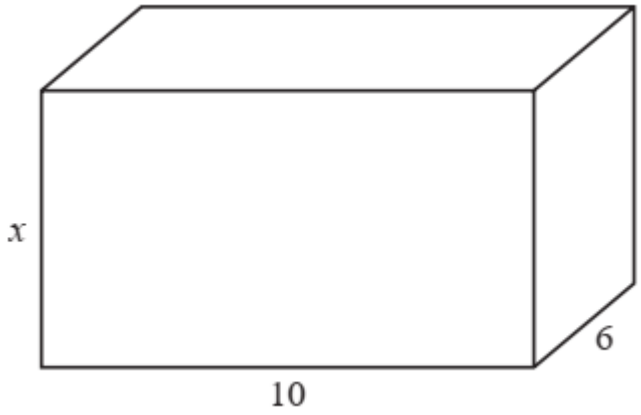
The container has length 15cm and width 8cm.
The volume of the container is 720cm^3.
(a) Calculate the height, h cm, of the container. [2]
(b) Calculate the surface area of the **outside** of the container. [2]
(c) Liquid is poured into the container. The liquid fills 60% of the container.
Calculate the height of the liquid in the container. [1]
4024/12/M/J/17 Q22)

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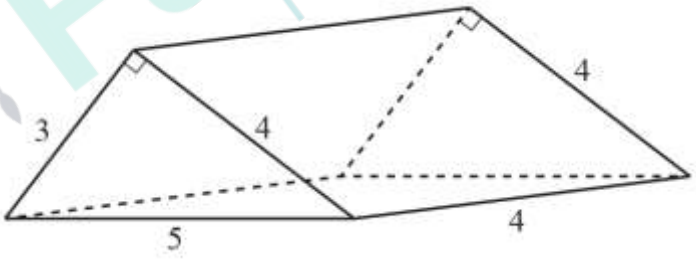
6. A cuboid has a square base.
   The length of the base of the cuboid is y cm.
   The height of the cuboid is twice the length of its base.
   The total surface area of the cuboid is 360 cm^2.
   Find the height of the cuboid. [3]
   4024/12/M/J/19 Q21)

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.

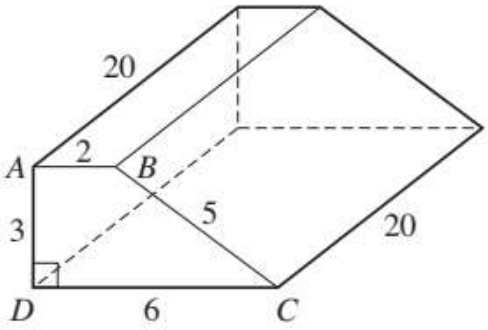


   Find the total surface area of the prism [2]
   4024/12/O/N/18 Q14

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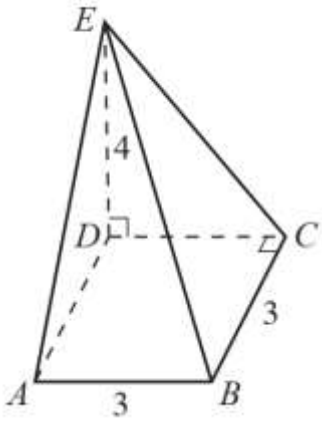
9. The diagram shows a solid prism of length 20 cm.
The cross-section, $ABCD$, is a trapezium.
$AB = 2$ cm, $BC = 5$ cm, $CD = 6$ cm,
$DA = 3$ cm and angle $ADC = 90°$.



(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)

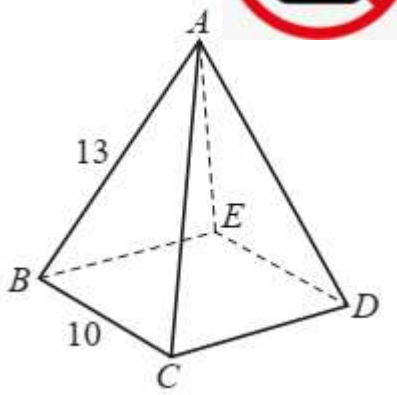


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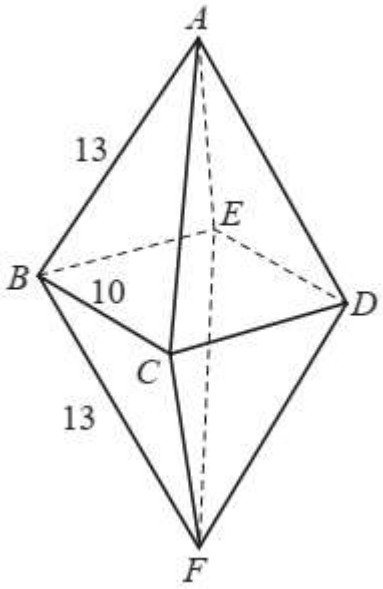


12. $ABCDE$ is a pyramid.
The base $BCDE$ is a square of side 10 cm.
The sloping faces are isosceles triangles.

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



(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 $ABCDEF$.

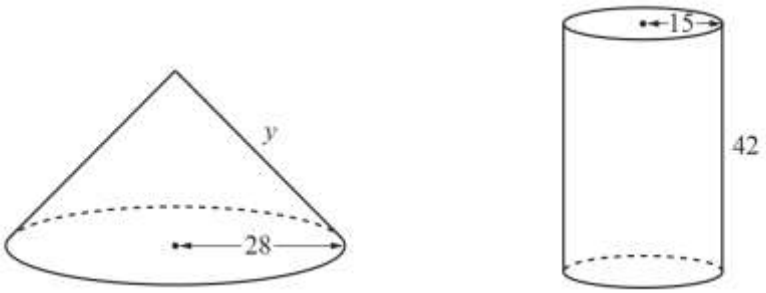


Calculate the surface area of the solid $ABCDEF$. [1]
4024/01/M/J/05 Q19(a) 60 (b)(i) 480

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)

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14. The diagram shows a cone and a cylinder



The cone has radius 28cm and slant height ycm.
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)

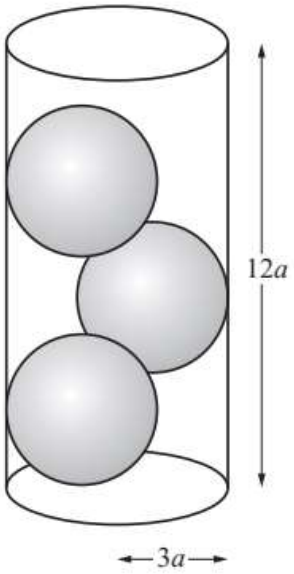
15. A solid cone has radius y cm.
The slant height of the cone is 25% larger than the radius of the cone.
A solid sphere has radius R cm.
The surface area of the sphere is equal to the total surface area of the cone.
(a) Show that $y = \frac{4R}{3}$. [3]
(b) Find the volume of the cone in terms of R.
Give your answer as simply as possible [4]
4024/11/O/N/22 Q23)

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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)

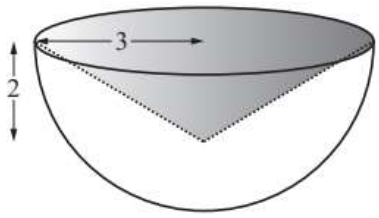
17. Three spheres, each of radius $2a$ cm are placed inside a cylinder of radius $3a$ cm and height $12a$ cm.
    Water is poured into the cylinder to fill it completely.
    The volume of water is $k\pi a^3$ cm^3.
    Find the value of k.
    4024/12/O/N/13 Q16)



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)

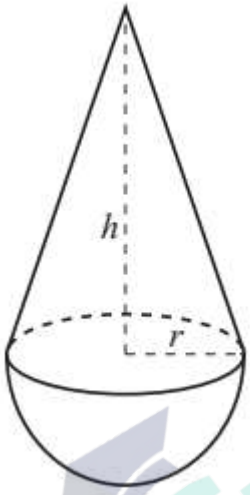
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19. A cone is removed from a solid wooden hemisphere of radius 3 cm.



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)

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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) $\pi r^2(2 + \sqrt{17})$

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