Mensuration

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Mensuration

1. What will be the area of trapezium whose parallel sides are 22 cm and 16 cm long, and the distance between them is 11 cm?
A) 209 cm^2
B) 282 cm^2
C) 265 cm^2
D) 179 cm^2
E) 302 cm^2

Option A
Solution:
Area of a trapezium = 1/2 (sum of parallel sides) * (perpendicular distance between them) = 1/2 (22 + 16) * (11) = 209 cm^2

2. The perimeter of a rectangle is 42 m. If the area of the square formed on the diagonal of the rectangle as its side is 1 1/12 % more than the area of the rectangle, find the longer side of the rectangle.
A) 19 m
B) 16 m
C) 9 m
D) 5 m
E) 12 m

Option E
Solution:
Let the sides of the rectangle be l and b respectively.
From the given data,
√(l2 + b2) = (1 + 1 1/12) lb
=> l2 + b2 = (1 + 13/12) lb = 25/12 * lb
$12(l^2 + b^2) = 25$ lb
Adding 24 lb on both sides
$12 l^2 + 12b^2 + 24lb = 25$ lb
$12(l^2 + b^2 + 2lb) = 49$ lb
$12(l + b)^2 = 49lb$
but 2(l + b) = 42 => l + b = 21
So $12(21)^2 = 49lb$
Solve, we get lb = 108
Since l + b = 21, longer side = 12 m

3. At the rate of Rs. 2 per sq m, cost of painting a rectangular floor is Rs 5760. If the length of the floor is 80% more than its breadth, then what is the length of the floor?
A) 25 m
B) 72 m
C) 67 m
D) 56 m
E) 46 m

Option B
Solution:
Let the length and the breadth of the floor be l m and b m respectively.
l = b + 80% of b = l + 0.8 b = 1.8b
Area of the floor = 5760/2 = 2880 sq m
l*b = 2880 i.e., l * l/1.8 = 2880
l = 72

4. A 7 m wide path is to be made around a circular garden having a diameter of 7 m. What will be the area of the path in square metre?
A) 298
B) 256
C) 308
D) 365
E) 387

Option C
Solution:
Area of the path = Area of the outer circle – Area of the inner circle = π{7/2 + 7}2 – π [7/2]2
= 308 sq m

5. The perimeter of a rectangle of length 62 cm and breadth 50 cm is four times perimeter of a square. What will be the circumference of a semicircle whose diameter is equal to the side of the given square?
A) 36 cm
B) 25 cm
C) 29 cm
D) 17 cm
E) 16 cm

Option B
Solution:
Let the side of the square be a cm.
Parameter of the rectangle = 2(62 + 50) = 224 cm Parameter of the square = 56 cm
i.e. 4a = 56
So a = 14
Diameter, d of the semicircle = 14 cm
Circumference of the semicircle = $1/2(\pi)(r) + d$
= 1/2(22/7)(7) + 14 = 25 cm

6. What is the volume of a cylinder whose curved surface area is 1408 cm^2 and height is 16 cm?
A) 7715 cm^3
B) 9340 cm^3
C) 8722 cm^3
D) 7346 cm^3
E) 9856 cm^3

Option E
Solution:
$2\pi rh = 1408$, h = 16
Solve both, so r = 14
Volume = $\pi r^2 h$ = (22/7) * 14 * 14 * 16 = 9856

7. A cone with diameter of its base as 30 cm is formed by melting a spherical ball of diameter 10 cm. What is the approximate height of the cone?
A) 6 cm
B) 3 cm
C) 2 m
D) 5 cm
E) None of these

Option C
Solution:
Radius of cone = 30/2 = 15, radius of ball = 10/2 = 5
Volumes will be equal, so
$(1/3)\ \pi\ r^2 h = (4/3)\ \pi\ R^3$
$15^2 h = 4 * 5^3$
So h = 2.2

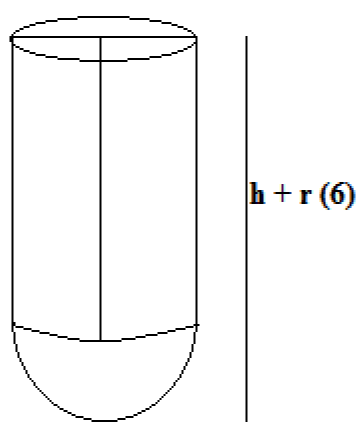
8. A cylinder whose base of circumference is 6 m can roll at a rate of 3 rounds per second. How much distance will the cylinder cover in 9 seconds?
A) 125 m
B) 162 m
C) 149 m

D) 173 m
E) 157 m

Option B
Solution:
Distance covered in one round = 2 x π x r = 6 m
Distance covered in 1 second = 3 x 6 = 18 m
So distance covered in 9 seconds = 18×9= 162m

9. A container is formed by surmounting a hemisphere on a right circular cylinder of same radius as that of hemisphere. If the volume of the container is 576π m^3 and radius of cylinder is 6 m, then find the height of the container.
A) 14 m
B) 12 m
C) 20 m
D) 18 m
E) 22 m

Option D
Solution:



Volume of the container = Volume of the cylinder + Volume of the hemisphere
Volume of the container = $\pi\, 6^2 h + (2/3)\, \pi\, 6^3 = 576\pi$
$= \pi\, 36\, (h + 4) = 576\pi$
Solving we get h = 12
So the height of the container = 12 + 6 = 18 m

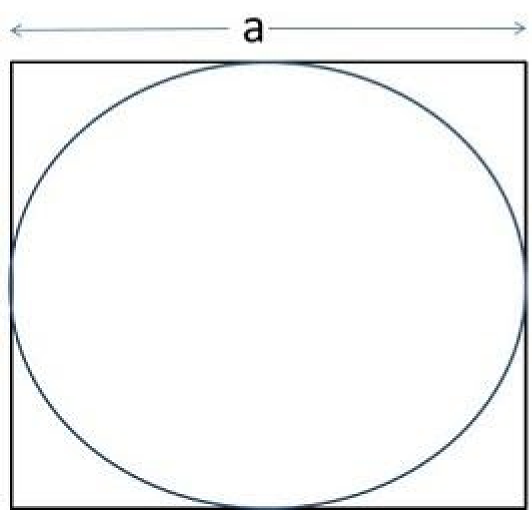
10. The radii of two cylinders are in the ratio 3 : 2 and their curved surface areas are in the ratio 3 : 5. What is the ratio of their volumes?
A) 8 : 11
B) 5 : 9
C) 7 : 4

D) 9 : 10
E) 13 : 7

Option D
Solution:
r1/r2 = 3/2 or r1 = 3/2 * r2
CSA1/CSA2 = 2πr1h1/2πr2h2 = 3/5
So h1/h2 = 2/5
Volume1/ Volume2 = πr1²h1/ πr2²h2 = 9/10

1. A right circular cone is exactly fitted inside a cube in such a way that the edges of the base of the cone are touching the edge of one of the faces of the cube and the vertex is on the opposite face of the cube. If the volumes of cube is 216 cm³ , what is the volume of the cone (approximately)?
A) 56 cm³
B) 60 cm³
C) 46 cm³
D) 50 cm³
E) None of these

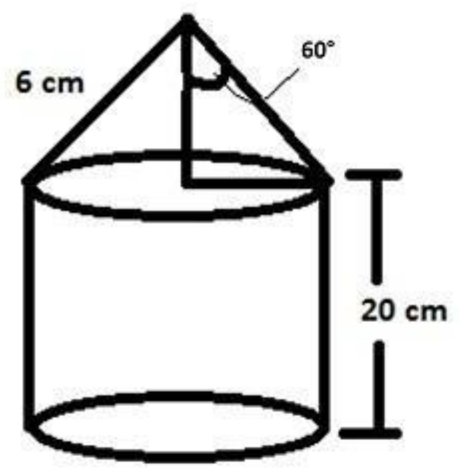
Option A
Solution:



radius of cone= a/2
volume(a^3)=216 , hence a=6
r= 3 cm; height of the cone= 6cm (as it is fitted in this cube of side 6 cm, hence its height will also be 6 cm)
Volume of cone= 1/3 π*r^2 * h
=56

2. The diagram shows a section of a rocket firework. If this section can be completely filled with gunpowder what is the volume of gunpowder required?
A) 1882 cm^3
B) 1782 cm^3
C) 1982 cm^3
D) 1682 cm^3
E) None of these

Option B
Solution:



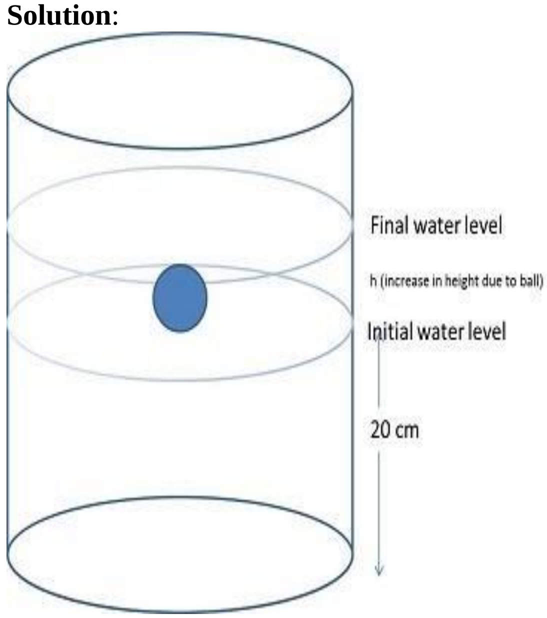
sin 60 = P/H=r/6=√3/2
=> r=3√3 cm
In the cone; $6^2 = h^2 + r^2$
h=3 cm
Volume of Gunpowder= Volume of Cone+ Volume of Cylinder=1/3 $\pi r^2 h + \pi r^2 h = \pi r^2 (1/3\ h+h)$
=22/7*27*21=1782

3. If a square, circle and rectangle has same perimeter then which one of them has the maximum area?
A) Square
B) Circle
C) Rectangle
D) All have equal area
E) Cannot be determined

Option B
Solution: In such case the area in descending order is: Circle> Square> Rectangle

4. A cylinder has some water at height 20 cm. If a sphere of radius 6 cm is poured into it then find the rise in height of water if the radius of cylinder is 4 cm.
A) 3 cm
B) 9 cm
C) 18 cm
D) 15 cm
E) None of these

Option C
Solution:



Volume of ball= volume of rising water in the cylinder
$4/3 * \pi * r^3 = \pi * r^2 * h$
$4/3*6*6*6=4*4*h$
h=18 cm

5. If the base of a pyramid is square and its side is 4√2 cm and slant height of pyramid is 5 cm, find the volume of pyramid.
A) 48 cm^3
B) 16 cm^3
C) 24 cm^3
D) 32 cm^3
E) None of these

Option D Solution:
l=slant height=5 cm ; h=height; side=4√2 cm
$l^2 = h^2 + [(side*\sqrt{2})/2]^2$
Note: The content inside bracket is the calculation for half of the diagonal of the square.
h= 3 cm
volume= 1/3 * Area of base * h
=1/3 * 32 * 3= 32

6. A sphere of 5 cm radius is melted and small sphere of radius 1 cm is made from it. Find the number of sphere that can be made from it.
A) 25
B) 125
C) 50
D) 100
E) None of these

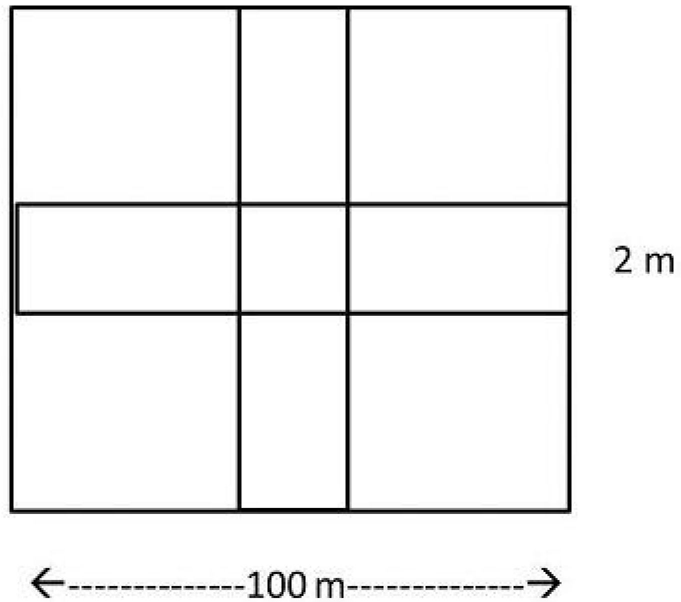
Option B
Solution: Number of sphere=Volume of large sphere/volume of small sphere
$[4/3* \pi *r1^3]/ [4/3* \pi *r2^3]$=5*5*5/1*1*1=125

7. A person wants to make a cylindrical box which is open from the top. If the height of that box is 10 cm and radius is 7 cm find the area of sheet which is required to make it.
A) 880 cm^2
B) 1188 cm^2
C) 594 cm^2
D) 440 cm^2
E) None of these

Option C
Solution: Area required=Curved surface area + Area of base= $2 \pi r h + \pi r^2 = 594$

8. A square park has a 2 m wide cross road in middle of it. If the side of park is 100 m then find the remaining area of the park.
A) 9650 m^2
B) 9596 m^2
C) 9600 m^2
D) 9604 m^2
E) None of these

Option D
Solution:

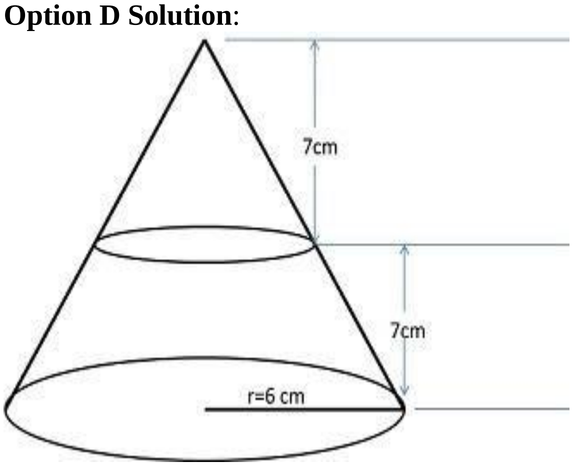


Total area= 10000

road area= 2*100 + 2*100- 2*2=396
remaining area=10000-396=9604

9. In a right circular cone the radius of its base is 6 cm and its height is 14 cm. A cross section is made through the mid-point of the height parallel to the base. The volume of the lower portion is?
A) 528 cm^3
B) 366 cm^3
C) 498 cm^3
D) 462 cm^3
E) None of these

Option D Solution:



Volume of cone= 1/3 π*r^2 * h
Volume of lower part=volume of full cone-volume of upper cone

for full cone take r=6, h=14
for upper cone take r1=r/2=3 and h=7
volume of lower part=528-66=462

10. If radius of cone decrease by 50% and height increase by 20%. Then find the percentage change in the volume.A) 70% decrease
B) 70% increase
C) 40% decrease
D) 40% increase
E) 20% increase

Option A
Solution:
Volume of cone= 1/3 π*r² * h
r=50% dec =1/2 =>2————1
2————1(dec)
h=20% inc =1/5 =>5—————-6 (inc)
2*2*5:1*1*6=10:3
(3-10)/10*100=70% dec

- The parameter of a square is equal to the perimeter of a rectangle of length 14 cm and breadth 20 cm. Find the circumference of a semicircle (approx.) whose diameter is equal to the side of the square.
A) 32 cm
B) 22 cm
C) 30 cm
D) 27 cm
E) 19 cm

Option D
Solution:
Parameter of square = 2 * (14+20) = 68cm
So side of square = 68/4 = 17 cm
So diameter of semicircle = 17 cm
So circumference of a semicircle = πr = 22/7 * 17/2 = 27 cm

- There are two circles of different radius such that radius of the smaller circle is three – sevens that of the larger circle. A square whose area equals 3969 sq cm has its side as thrice the radius of the larger circle. What is the circumference of the smaller circle?
A) 59 cm
B) 56.5 cm
C) 49.5 cm
D) 65.5 cm
E) 62 cm

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Option B
Solution:
Side of square = √3969 = 63 cm
So radius of larger circle = 1/3 * 63 = 21 cm
So radius of smaller circle = 3/7 * 21 = 9 cm
So circumference of smaller circle = 2 * 22/7 * 9 = 56.5 cm

- A Birthday cap is in the form of a right circular cone which has base of radius as 9 cm and height equal to 12 cm. Find the approximate area of the sheet required to make 8 such caps.

A) 3225 cm^2
B) 3278 cm^2
C) 3132 cm^2
D) 3392 cm^2
E) 3045 cm^2

Option D
Solution:
r = 9, h = 12
So slant height, l = $\sqrt{(9^2+12^2)}$ = 15 cm
So curved surface area of a cap = πrl = 22/7 * 9 * 15 = 424 sq. cm
So curved surface area of 8 such cap = 424*8 = 3392 sq. cm which is also equal to area of sheet required to make 8 such caps

- The barrel of a fountain pen is cylindrical in shape which radius of base as 0.7 cm and is 5 cm long. One such barrel in the pen can be used to write 300 words. A barrel full of ink which has a capacity of 14 cu cm can be used to write how many words approximately?

A) 598
B) 656
C) 508
D) 545
E) 687

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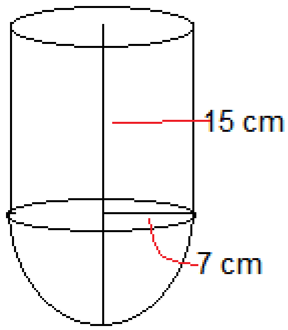
Option D
Solution:
Volume of the barrel of pen = $\pi r^2 h$ = 22/7 * 0.7*0.7 * 5 = 7.7 cu cm
A barrel which has capacity 7.7 cu cm can write 300 words
So which has capacity 14 cu cm can write = 300/7.7 * 14 = 545 words

- A vessel is in the form of a hemi-spherical bowl on which is mounted a hollow cylinder. The diameter of the sphere is 14 cm and the total height of vessel is 15 cm, find the capacity of the vessel.

A) 1977.23 cm^3
B) 1999.45 cm^3
C) 1840.67 cm^3
D) 1950.67 cm^3
E) 1833.27 cm^3

Option D
Solution:



Diameter is 14, so radius is 7 cm
Total height = 15 cm, so height of cylinder = 15-7 = 8 cm (because height of hemisphere is same as its radius)
Capacity of vessel = volume of cylinder + vol of hemisphere
So = $\pi r^2 h + 2/3 * \pi r^3$
= 22/7 * 7 * 7 * 8 + 2/3 * 22/7 * 7 * 7 * 7
= 1232 + 718.67
= 1950.67 cu cm

- A car has wheels of diameter 70 m. How many revolutions can the wheel complete in 20 minutes if the car is travelling at a speed of 110 m/s?

A) 550
B) 580
C) 630
D) 640
E) 600

Option E
Solution:
Radius of wheel = 70/2 = 35 cm
Distance travelled in one revolution = $2\pi r$ = 2 * 22/7 * 35 = 220 cm
Let the number of revolutions made by wheel is x
So total distance travelled = distance travelled in one revolution * number of revolutions
So total distance travelled = 220x cm
20 mins = 20*60 seconds
Speed of car = 220x/(20*60)
So 110 = 220x/(20*60)
Solve, x = 600

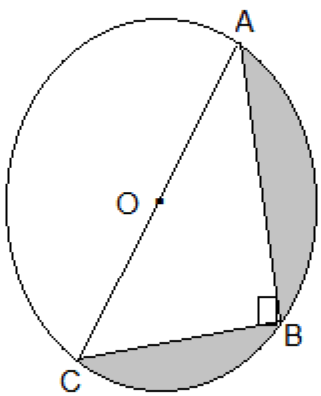
- A clock has its minute hand of length 7 cm. What area will it swept in covering 10 minutes?

A) 32.17 cm^2
B) 35.67 cm^2
C) 45.45 cm^2
D) 41.23 cm^2
E) None of these

Option B
Solution:
Length will be the radius, so r = 7cm

Minute hand covers 360° in 60 minutes
So in 10 minutes it covers = 60°
Area of arc = angle it makes/360 * πr^2
So area covered = 60/360 * 22/7 * 7 * 7 = 25.67

- Find the area of shaded region (approximately) in the given figure if AB = 12 cm and BC = 9 cm with O being the centre of circle.



A) 40 cm cm^2
B) 27 cm cm^2
C) 23 cm^2
D) 39 cm^2
E) 34 cm^2

Option E
Solution:
ABC forms a right angles triangle, so AC = √(9^2 + 12^2) = 15 cm
So diameter of circle = 15 cm, so radius = 15/2 cm
Area of semicircle = ½ * 22/7 * 15/2 * 15/2 = 88.39 sq cm
Area of triangle = 1/2 * base * height = 1/2 * 9 * 12 = 54 sq cm
So area of shaded region = 88.39 – 54 = 34

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- The diameters of the internal and external surfaces of a hollow spherical shell are 10cm and 6 cm respectively. If it is melted and recasted into a solid cylinder of length 8/3 cm, find the diameter of the cylinder.

A) 28√2 cm
B) 14√2 cm
C) 26√2 cm
D) 18√2 cm
E) 22√2 cm

Option A
Solution:
External diameter of a sphere = 10 cm
Internal diameter of the sphere = 6 cm
Volume of the sphere = 4/3 π ($R^3 – r^3$)
= (4/3) (22/7) ($10^3 – 6^3$)

= (4/3) (22/7) (784)
= 9856 / 3 cm^3
Height of the cylinder formed = 8/3 cm
Let the radius of the cylinder be 'r' cm
Volume of the cylinder = $\pi r^2 h$
= 22/7 * r^2 * 8/3
= 22/7 * r^2 * 8/3 = 9856 / 3
r^2 = 392
r = 14√2 cm
So Diameter of the cylinder = 2 x 14√2 =28√2 cm

- The radii of two cylinders are in the ratio 4 : 5 and their curved surface areas are in the ratio 3 : 5. What is the ratio of their volumes?

A) 11 : 24
B) 13 : 21
C) 7 : 19
D) 11 : 15
E) 12 : 25

Option E
Solution:
r1/r2 = 4/5
CSA1/CSA2 = 2πr1h1/2πr2h2 = 3/5
So h1/h2 = 3/4
Volume1/ Volume2 = $\pi r1^2 h1 / \pi r2^2 h2$ = 12/25

1. The height of the cone is 24 cm and the curved surface area of cone is 550 cm^2. Find its volume.
   A) 1200 cm^2
   B) 1232 cm^2
   C) 1240 cm^2
   D) 1260 cm^2
   E) 1262 cm^2

   Option B
   Solution:
   Volume= 1/3 $\pi * r^2 * h$
   Answer will be divisible by 11, as in pie we have 2*11. As only 1232 is divisible by 11, it is the answer

2. The side of a square base of a pyramid increases by 20% and its slant height increases by 10%. Find the per cent change in Curved Surface Area.

A) 28%
B) 58.4%
C) 32%
D) 45.20%
E) 48%

Option C
Solution:
C.S.A=1/2*(perimeter of base)*l
20+10+(20*10)/100=32%

3. If a copper wire is bend to make a square whose area is 324 cm^2. If the same wire is bent to form a semicircle, then find the radius of semicircle.
A) 7 cm
B) 14 cm
C) 11 cm
D) 21 cm
E) 12 cm

Option B
Solution:
Area of square= 324, hence side =18
Perimeter = 4a =4*18=72
Circumference of semicircle= 2r+Pie *r
r(2+pie)=72
r=14 cm

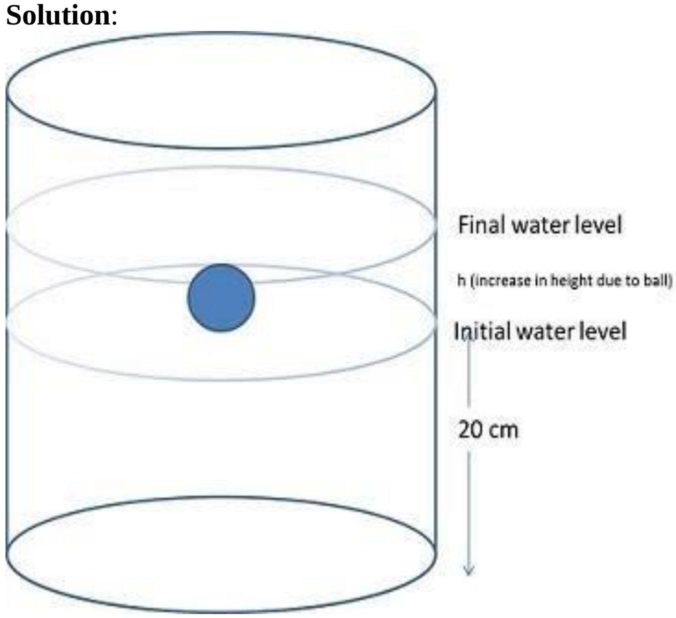
4. A man wants to make small sphere of size 1 cm of radius from a large sphere of size of 6 cm of radius. Find out how many such sphere can be made?
A) 216
B) 125
C) 36
D) 200
E) 64

Option A
Solution:
Volume of sphere1/volume of sphere 2= required number of sphere
=6*6*6/1*1*1=216

5. A sphere of radius 9 cm is dip into a cylinder who is filled with water upto 20 cm. If the radius of cylinder is 6 cm find the percentage change in height.
A) 50%
B) 40%
C) 55%
D) 45%

E) 57%

Option D
Solution:



Volume of sphere= volume of cylinder from height 20 cm to upwards.

$4/3 * \pi * 9*9*9 = \pi * 6*6*h$

h=9

new height=20+9=29

%change= 9/20*100=45%

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6. The length of the perpendicular drawn from any point in the interior of an equilateral triangle to the respective sides are P1, P2 and P3. Find the length of each side of the triangle.

A) $2/\sqrt{3} *(P1 + P2 + P3)$
B) $1/3 * (P1 + P2 + P3)$
C) $1/\sqrt{3} *(P1 + P2 + P3)$
D) $4/\sqrt{3} *(P1 + P2 + P3)$
E) $5/\sqrt{3} *(P1 + P2 + P3)$

Option A

7. A conical cup is filled with ice cream. The ice cream forms a hemispherical shape on its top. The height of the hemispherical part is 7 cm. The radius of the hemispherical part equals the height of cone then the volume of ice cream is?

A) 1078 cm^3
B) 1708 cm^3
C) 7108 cm^3

D) 7180 cm^3
E) 1808 cm^3

Option A
Solution:
Volume = volume of hemisphere + volume of cone= $2/3 * \pi * r^3 + 1/3 \pi * r^2 * h$
=1078

8. Assume that a drop of water is spherical and its diameter is one tenth of a cm. A conical glass has equal height to its diameter of rim. If 2048000 drops of water fill the glass completely then find the height of the glass.
A) 12 cm
B) 16 cm
C) 20 cm
D) 8 cm
E) 10 cm

Option B
Solution:
diameter of drop of water=1/10 => radius=1/20
volume of 204800 drop of water=$204800*4/3* \pi*1/20 *1/20*1/20 = 1024 \pi/3$
Volume of cone=$1024 \pi/3 = 1/3 * \pi * r^2 * h$ (r=h/2)
h=16

9. If the radius of a sphere increase by 4 cm then the surface area increase by 704 cm^2 . The radius of the sphere initially was?
A) 5
B) 4
C) 6
D) 8
E) 10

Option A
Solution:
$4 \pi(r+4)^2 – 4 * \pi*r^2 = 704$
solve and get r=5

10. By melting two solid metallic spheres of radii 1 cm and 6 cm, a hollow sphere of thickness 1 cm is made. The external radius of the hollow sphere will be.
A) 8 cm
B) 9 cm

C) 6 cm
D) 7 cm
E) 10 cm

Option B
Solution:
$4/3 * \pi (R^3 + r^3) = 4/3 * \pi * ((x+1)^3 - x^3)$
R=6 cm; r=1 cm; x= radius of hollow sphere inner; (x+1)=outer radius
solve and get x=8
outer=x+1=9 cm

1. A room 10mtr long 4mtr broad and 4mtr high has two windows of 2*1mtr and 3*2mtr. Find the cost of papering the walls with paper 50cm wide at 25paisa per meter?
A) Rs48
B) Rs50
C) Rs52
D) Rs54
E) Rs46

Option C
Solution:
Area of walls = 2(10+4)*4 =112
Area of windows = 2+6 = 8
Area to be covered = 112−8= 104mtr
Length of paper = 104/50*100 =208m
Cost = 208*25/100 = 52

2. A cubical block of 8m*12m*16m is cut into exact number of equal cubes. The least possible number of cubes will be?
A) 9
B) 24
C) 18
D) 30
E) 12

Option B
Solution:
H.C.F of 8,12,16 =4
Least number of cubes = 8*12*16/4*4*4 = 24

3. Find the volume, curved surface area and the total surface area of a hemisphere of radius 21cm?
A) $19404cm^3$, $2772cm^2$, $4158cm^2$
B) $4158cm^3$, $5000cm^2$, $4000cm^2$
C) $20000cm^3$, $40000cm^2$,$1000cm^2$
D) $30000cm^3$, $2000cm^2$,$5000cm^2$
E) $40302cm^3$, $3320cm^2$,$5650cm^2$

Option A
Solution:
The option which gets divided by 11, will be the answer
Method to check – 19404 = add alternate number = 1+4+4 =9
0+9= 9
Find difference = 9-9=0
If difference is either 0 or divisible of 11 then number is divisible of 11.
Ans ¬– A

4. A right circular cone is exactly fitted inside a cube in such a way that the edges of the base of the cone are touching the edges of one of the faces of the cube and the vertex is on the opposite face of the cube. If the volume of cube is 2744 cubic cm, what is the approximate volume of the cone?
A) 715
B) 719
C) 729
D) 725
E) 710

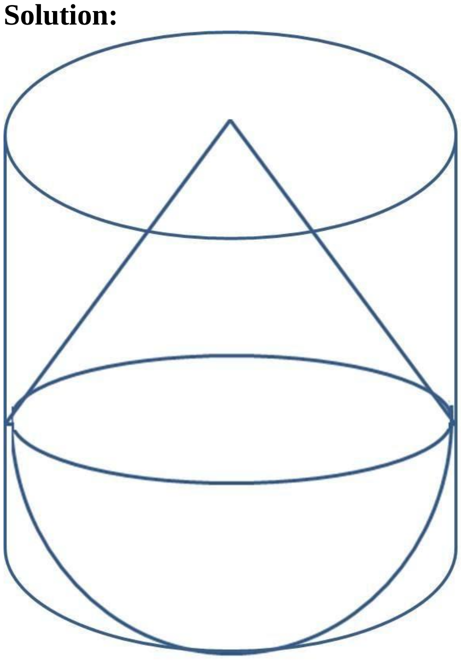
Option B
Solution:
side of cone $3\sqrt{2744}$ = 14
Radius of cone = 7
Height = 14
Volume = 1/3 ∏r^2h
1/3*22/7*7*7*14 = 718.66= 719

5. A hollow cylindrical tube is open at both ends is made of iron 4cm thick. If the external diameter be 52cm and the length of the tube be 120cm, find the number of cubic cm of iron in it?approx
A) 72419
B) 72425
C) 72405
D) 72411
E) 72534

Option D
Solution:
H = 120 external diameter – 52
External radius = 26
Internal radius = 26-4 =22
Volume of iron = external volume – internal volume
22/7 * 26 * 26 * 120 – 22/7 * 22 * 22 * 120 = 72411

6. A solid toy is in the form of a hemisphere surmounted by a right circular cone. Height of the cone is 2cm and the diameter of the base is 4cm. If a right circular cylinder circumscribe the solid, find how much more space will it cover?
A) 4π cm^3
B) 2π cm^3
C) 16π cm^3
D) 8π cm^3
E) 8π cm^3

Option D
Solution:



R of hemisphere =4/2 = 2cm
H of cylinder = 4cm
R of cone = 2cm
V of cylinder – volume of solid =
$=\pi*2^2*4 -(2/3\ \pi*2^3+1/3*\pi*2^3)$
$= 16\pi - 8\pi$
$= 8\pi$

7. The ratio between volumes of a hemisphere and a cone is 1:1. If the cone's height is equal to its diameter, then find the ratio of diameter of hemisphere and cone ?

A) 2:1
B) 1:1
C) 3:2
D) 2:3

Option B
Solution:
let the radius of hemisphere and cone are r1 and r2
H's volume/c's volume = 1/1
So [2/3 $\pi r1^3$]/[1/3 $\pi r2^2$*2r2] = 1/1
So r1 : r2 = 1 : 2 or D1 : D2 = 1: 1

8. If the height of a pyramid is 12cm and its base is a square which perimeter is 40cm, then find the volume of pyramid?
A) 300 cm^3
B) 200 cm^3
C) 400 cm^3
D) 500 cm^3

Option C
Solution:
perimeter of base =40
Side of base = 10
Area of base = 100
Volume = 1/3 * area of base * height
= 1/3 * 100 * 12 = 400cm^3

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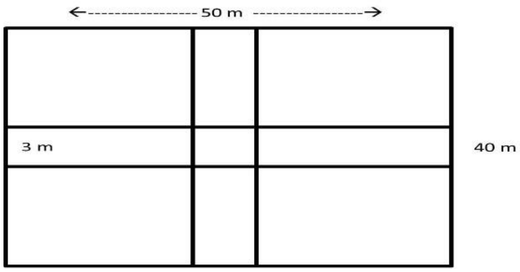
9. If the perimeter of square, circle, rectangle, are equal. Then whose area is largest?
A) Circle
B) Square
C) Rectangle
D) All are equal

Option A
Solution:
when perimeter of these are equal then descending order of area is
Circle >square> rectangle.
So option A is Ans

10. A rectangular plot of grass is 50m long and 40m broad. From the center of each side a path of 3m wide goes across the center of the opposite side. Find the area of path?
A) 270
B) 280

C) 251
D) 261

Option D
Solution:



area of road = 3*50 + 3*40 −3^2
= 270 −9=261

- Poles are to be fixed along the boundary of a rectangular field in such a way that distance between any two adjacent poles is 2 m.The perimeter of the field is 70m and length and the breadth of the field are in the ratio 4:3 resp. How many poles will be required?

A) 42
B) 40
C) 35
D) 38
E) 45

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Option C
Solution:
Required between the two poles = (Perimeter/Dist.between any two adjacent poles) = 70 / 2 = 35

- The circumference of a circular garden is 1320m.Find the area. Outside the garden , a road of 2m width runs around it .What is the area of this road and calculate the cost of gravelling it at the rate of 50 paise per sq. m .

A) 2500.15 m^2, Rs.1500.15
B) 2652.57 m^2, Rs.1326.285
C) 2541.14 m^2, Rs.1600.47
D) 3245.78 m^2,Rs.2000
E) 4157.12 m^2,Rs.1452.11

Option B
Solution:
Circumference of the garden = 2*pi*R = 1320

R= 210m
Outer radius = 210 +2= 212 m
Area of the road = pi*(212)^a – pi*(210)^2
= pi*422*2 = 2652.57 m^2
Therefore ,
cost of gravelling = 2652.57 * 0.5 = Rs.1326.285

- A square shape of park of area 23,104 sq. m is to be enclosed with wire placed at heights 1,2,3,4 m above the ground . Find required length of the wire ,,if its length required for each circuit is 10% greater than the perimeter of the field ?

A) 2675.2m
B) 2145.12m
C) 2750m
D) 2478.11m
E) 2400.5m

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Option A
Solution:
Perimeter = √23,104 * 4 = (152 * 4)m
Length of each circuit = 152 * 4 *(110/100)
The wire goes around 4 times ,so the total length of the wire required = 152 * 4 *(110/100) * 4 = 2675.2 m

- Area of a hexagon is 54√3 cm^2. What is its side ?

A) 7cm
B) 5cm
C) 4cm
D) 6cm
E) 8cm

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Option C
Solution:
(6√3/4) *a^2 = 54√3
=> a^2 = 36
=> a = 6 cm

- Smallest side of a right angled triangle is 8 cm less than the side of a square of perimeter 64cm . Second largest side of the right angled triangle is 4 cm less than the length of rectangle of area 112 sq. cm and breadth 8 cm .What is the largest side of the right angled triangle?

A) 9.2cm
B) 7.75cm
C) 10.50cm
D) 14cm

E) 12.80cm

Option E
Solution:
Side of a square = (perimeter /4) = 64/4 = 16 cm
smallest side = 16 – 8 = 8cm
Length of the rectangle = Area/Breadth = 112/8 = 14cm
Second side of triangle = 14 – 4 = 10cm
Hypotenuse of the right angled triangle = √(8)^2+(10)^2 = 12.80 cm

- If the radius of the circular field is equal to the side of a square field .If the difference between the area of the circular field and area of the square field is 5145 sq. m ,then calculate the perimeter of the circular field?

A) 421m
B) 315m
C) 310m
D) 308m
E) 300m

Option D
Solution:
Let the radius of the circular field and the side of the square field be r
Then,
pi*r^2 – r^2 = 5145
=> r^2[(22-7)/7] = 5145
=> r = 49 m
Therefore ,
circumference of the circular field = 2*pi*r = 308m

- A rectangular plot has a concrete path running in the middle of the plot parallel to the parallel to the breadth of the plot. The rest of the plot is used as a lawn ,which has an area of 240sq. m. If the width of the path is 3m and the length of the plot is greater than its breadth by 2m ,what is the area of the rectangular plot(in m)?

A) 410m
B) 288m
C) 250m
D) 300m
E) 320m

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Option B
Solution:
Let width be x m
and length be (x+2)m
Area of path = 3x sq. m
x(x+2) – 3x = 240
=> x^2 – x – 240 = 0
=> x(x – 16) +15 (x – 16) = 0
=>(x – 16)(x + 15) = 0
=>x = 16
Length = 16 + 2 = 18m
Therefore ,
Area of plot = 16 * 18 = 288sq. m

- A solid spherical ball of radius r is converted into a solid circular cylinder of radius R. If the height of the cylinder is twice the radius of the sphere ,then find the relation between these two with respect to radius.

A) R = r√(3/4)
B) R = r√(3/2)
C) R = r√(1/2)
D) R = r√(2/3)
E) R = r√(1/3)

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Option D
Solution:
Since one object is converted into another so the volume will remain the same .
Therefore ,
(4/3)*pi*r^3 = pi*R^2*H
=>R = r√(2/3)

- A rectangular tank of length 37 (1/3) m internally , 12 m in breadth and 8 m in depth is full of water .Find the weight of water in metric tons, given that one cubic metre of water weighs 1000kg.

A) 3584 metric tons
B) 4500 metric tons
C) 4101 metric tons
D) 3870 metric tons
E) 5721 metric tons

Option A
Solution:
Volume of water = 37(1/3)*12*8 m^3
Weight of water = (112/3)*12*8*1000 = 3584metric tons.

- An equilateral triangle and a regular hexagon have equal perimeters. The ratio of the area of the triangle and that of the hexagon is :

A) 3:4
B) 4:9
C) 1:2
D) 2:3
E) 4:5

Option D
Solution:
Let side of triangle be x and the side of regular hexagon be y .
3x = 6y
=>x = 2y
Area of triangle = $(\sqrt{3}/4)x^2$
Area of hexagon = $6*(\sqrt{3}/4) * y^2 = (3\sqrt{3}/8)*x^2$
Required ratio = 2 : 3

- A solid metallic spherical ball of radius 28 cm is melted down and recast into small cones. If the diameter of the base of the cone is 28 cm and the height is 4 cm, find the number of such cones can be made ?

A) 106
B) 118
C) 112
D) 95
E) None

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Option C
Solution:
Volume of sphere = (4/3)πr^3
Volume of cone = (1/3)πr^2h
Let the number of cones be 'X'
=> (4/3) *π *28^3 = (1/3) *π *14^2*4* (X)
=> X = 112

- The length and the breadth of a rectangular table are increased by 1 m each and due to this the area of the table increased by 27 sq. m. But if the length is increased by 1 m and breadth decreased by 1 m, area is decreased by 7 sq. m. Find the perimeter of the table.

A) 45m
B) 52m
C) 60m
D) 72m
E) None

Option B
Solution:
Let original length = l, breadth = b, so area = lb
When l and b increased by 1:
(l+1)(b+1) = lb + 27
Solve, l + b = 26
When l increased by 1, b decreased by 1:
(l+1)(b-1) = lb – 7
Solve, l – b = 6
Now solve both equations, l = 16, b = 10
Perimeter = 2(16+10)=52m

- The water in a rectangular tank having a base 80 m by 60 m is 6.5 m deep. In what time can the water be emptied by a pipe of which the cross-section is a square of side 20 cm, if the water runs through the pipe at the rate of 20 km per hour?

A) 39hrs
B) 45hrs
C) 60hrs
D) 40hrs
E) None

Option A
Solution:
Volume of water in the tank is 80*60*6.5=31200m^3
Then Volume of water flown in 1hr is 20*1000(in meter)*20/100*20/100(in meter)=800m^3
Time taken=31200/800=39hrs

- The perimeter of a square is twice the perimeter of a rectangle. If the perimeter of a square is 140cms and the length of the rectangle is 20cm. Find the breadth of the rectangle?

A) 18
B) 20
C) 15
D) 12
E) None

Option C
Solution:
Perimeter of a Square = 4a = 140
a = 140/4 = 35cm
Perimeter of a rectangle = 140/2 = 70cm =2(l+b)

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2(20+b) = 70
B = 35-20 = 15

- A farmer wishes to grow a 100 m2 rectangular vegetable garden. Since he has with him only 30 m barbed wire, he fences three sides of the rectangular garden letting compound wall of his house act as the fourth side fence. Find the dimension of his garden.

A) 20, 5
B) 25, 4
C) 15, 5
D) 10,10
E) None

Option A
Solution:
Area of the garden = 100 m2
⇒ l × b = 100
⇒ b= 100/l
Garden is fenced on three sides.
Length of fencing = 2l + b = 30
⇒ (200/b + b= 30
⇒ b2 – 30b + 200 = 0
⇒ (b – 20)(b – 10) = 0
⇒ b= 20 or 10
⇒ l = 100/20 = 5 or 100/10 = 10
The garden is in the shape of a rectangle.
Therefore, the length and the breadth of the garden are 5 m and 20 m respectively.

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- Inside a square plot a circular garden is developed which exactly fits in the square plot and the diameter of the garden is equal to the side of the square plot which is 28m. What is the area of space left out in the square plot after developing the garden ?

A) 132m2
B) 140m2
C) 168m2
D) 156 m2
E) None

Option C
Solution:
area of space left = (area of square – area of circle)28*28 – (22/7*14*14)
= 784 – 616
= 168 m2

- A room is 7.5 m long, 5.5 m broad and 5 m high. What will be the expenditure in covering the walls by paper 40 cm broad at the rate of 80 paise per metre ?

A) 255.5
B) 260
C) 282.25
D) 244
E) None

Option B
Solution:
Area of four walls = 2 × 5 (7.5 + 5.5) = 130 m^2
Area of required paper = 130 m^2
Breadth of the paper = 40 cm = 0.4 m
∴ Length of the paper =130/0.4= 325 m
∴ Cost of paper at 80 paise per meter = 325 × 0.80 = Rs.260

- In measuring the sides of a rectangle, one side is increases by 30%, and the other side is decreased by 15%. What is the change in its area as a percentage ?

A) 7.5
B) 8
C) 10.5
D) 11
E) 12

Option C
Solution:
Let initial area of a rectangle is 100.
Then 100*130/100*85/100=110.5
The change in Diff is 110.5-100=10.5

- The ratio between three angles of a quadrilateral is 7:11:13 respectively. the value of the fourth angle of the quadrilateral is 112°. what is the difference between the largest and smallest angles of the quadrilateral ?

A) 72°
B) 110°
C) 90°
D) 56°
E) None

Option D
Solution:
Total angles of quadrilateral is 360 °
7x+11x+13x+112=360
=>31x=360-112

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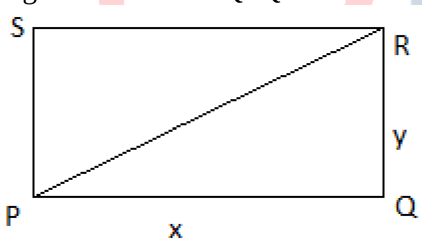
=>x=248/31=8
Then 1st angle =7x=7×8=56°
2nd angle=11×8=88°
3rd angle =13×8=104
the largest angle =112°
smallest angle = 56°
difference between largest and smallest angle =112-56=56°

- A took 15 seconds to cross a rectangular field diagonally walking at the rate of 52 m/min and B took the same time to cross the same field along its sides walking at the rate of 68 m/min. The area of the field is:

A) 30 m^2
B) 40 m^2
C) 50 m^2
D) 60 m^2
E) None

Option D
Solution:
length of the diagonal= PR=52*15/60=13m
Length of its side =PQ+QR= 68*15/60=17m



Then x+y=17 and From pythagoras theorem x^2+y^2=169(13^2)
Solving both x=12 and y=5
Area =12*5=60m^2

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