Q:1 The diameter of a hemisphere is 42 cm. There is also a sphere whose radius is 2/3rd of the radius of the given hemisphere. What is the difference between the volume of the hemisphere and the sphere in question?
1. 5436.66 cm^3
2. 7905.33 cm^3
3. 6545.66 cm^3
4. 8321.33 cm^3

Q:2 A conical vessel whose internal base radius is 18 cm in height is 60 cm is full of a liquid. The entire liquid of the vessel is emptied into a cylindrical vessel with an internal radius of 15 cm. The height to which the liquid rises in the cylindrical vessel is?
1. 30.2 cm
2. 28.8 cm
3. 27 cm
4. 24 cm

Q:3 Circumference of semi-circle of radius 14 cm is 6 cm less than the perimeter of sector of another circle. If the angle of the sector is 45 degree then find the radius of another circle.
1. 28.5 cm
2. 35 cm
3. 42 cm
4. 32.6 cm

Q:4 If the numerical value of the area of a quarter circle of radius 14 cm is equal to the side of a square, then find the area of the square.
1. 22914 cm^2
2. 25316 cm^2
3. 51240 cm^2
4. 32140 cm^2

Q:5 At one corner of a square field, a cow is tied with a rope and it can graze only 38.5% of the total area of the field. If the cost of fencing the field at the rate of Rs 3.5 per meter is Rs 140, then what is the length of the rope?
1. 8 meters
2. 6 meters
3. 14 meters
4. 7 meters

Q:6 If it requires 100 gm paint for painting a door 15 cm × 10 cm, how much paint is required for painting a 5 cm × 6 cm?
1. 30 gm
2. 28.5 gm
3. 25 gm
4. 20 gm

Q:7 The lengths of the parallel sides of the trapezium are 51 cm and 21 cm, and that of each of the other two sides is 39 cm. What is the area (in cm^2) of the trapezium?
1. 1206
2. 1296
3. 1152
4. 1260

Q:8 If the diameter of each circle is 14 cm and DC = CE then, find the area of triangle BCE.
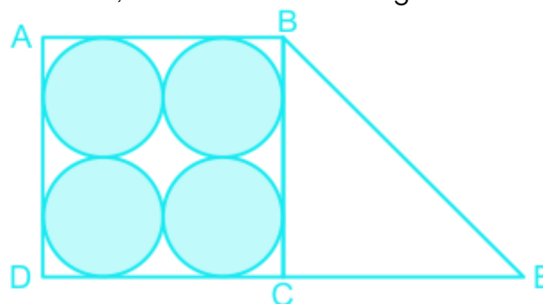
1. 585 cm^2
2. 641 cm^2
3. 1205 cm^2
4. 525 cm^2

Q:9 The total surface area of a hemisphere is equal to the total surface area of a sphere. What is the ratio of the volume of the sphere to that of the hemisphere?
1. 3√3 : 8
2. 2 : 3√3
3. 4 : 3√3
4. 8 : 3√3

Q:10 A pyramid has the base of a square with each side of the base equal to 8 m and the upper part of the pyramid forms an equilateral triangle on every side. Find the total surface area of the pyramid.
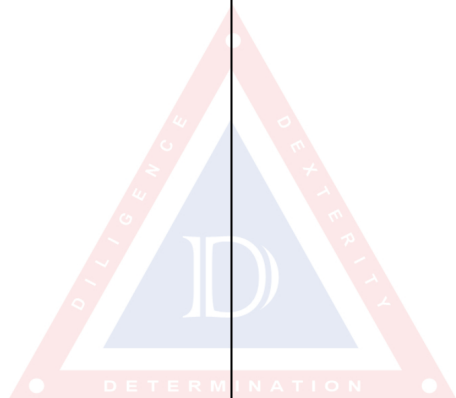
1. $64(\sqrt{3} + 1)m^2$
2. $65(\sqrt{2} + 1)m^2$
3. $60(\sqrt{3} - 2)m^2$
4. $57(\sqrt{3} + \sqrt{2})m^2$

Answer Key

1. (2)	2. (2)	3. (4)	4. (5)	5. (4)
6. (4)	7. (2)	8. (5)	9. (5)	10. (1)

Answers and Solutions

Q:1 The correct answer is **Option 2** i.e. **7905.33 cm^3**
Diameter of hemisphere = 42 cm
Radius = 42/2 = 21 cm
The volume of hemisphere is = $2/3 × πr^3$
= 2 × 213 × π/3 = 18522 × π/3
Now, radius of Sphere = 2/3 × 21 = 14 cm
The volume of the sphere = $4/3 × πr^3$
= 4 × 143 × π/3 = 10976 × π/3
The difference in volume:
(18522 - 10976) × π/3
⇒ 7546 × π/3
⇒ 7905.33 cm3

Q:2 The correct answer is **Option 2** i.e. **28.8 cm.**
Conical vessel volume = $1/3πr_1^2h_1$ where r_1 = 18cm
and h_1 = 60cm
and cylindrical vessel volume = $πr_2^2h_2$
So, volume of conical = volume of cylinder then,
$1/3(18)^2 × 60 = π × 15 × 15h_2$
$h_2 = (324 × 20)/225$
h_2 = 28.8 cm

Q:3 The correct answer is **option 4** i.e. **32.6 cm**
Radius of semi-circle = 14 cm
So, Circumference of semi-circle = πr + 2r
= 14 × (22/7 + 2) = 36 × 2 = 72 cm
Suppose radius of another circle = R cm
Angle of the sector is 45 degrees.
So, Perimeter of sector of another circle = 2R + (2πR × 45/360) = 2R + πR/8
According to the question: 2R + πR/8 = 72 + 6
R × (2 + 22/56) = 78
134R/56 = 78
R = 32.6
Hence, Radius of another circle = 32.6 cm

Q:4 The correct answer is **option 5** i.e. **23716 cm^2.**
Given:- Area of quarter circle = side of the square
So,

⇒ a = $1/4 × π × (r)^2$
⇒ a = 1/4 × 22/7 × 14 × 14
⇒ a = 154
Hence,
Area of square = (154 × 154) = 23716 cm^2

Q:5 The correct answer is **option 4** i.e. **7 meters.**
Perimeter of the field = 140/3.5 = 40 meters
Side of the field = 40/4 = 10 meters
Area of the field = 10^2 = 100 square meters
Let the length of the rope = r meters
Area grazed by cow = 38.5% of 100 = 38.5 meters^2
Now angle of the corner of the field in which cow is grazing = 90°(as the field is square)
Thus,
Area grazed by cow = 90°/360° × (22/7) × r^2
= (1/4) × (22/7) × r^2 = 38.5
⇒ r^2 = 49
⇒ r = 7 meters

Q:6 The correct answer is **Option 4** i.e. **20 gm.**
Area of rectangle = (length × breadth)
100 gm required to paint 150 cm^2
⇒ paint required to paint 1 cm^2 = (100/150)
⇒ paint required to paint 30 cm^2
= (100/150) × 30 = 20 gm

Q:7 The correct answer is **Option 2** i.e. **1296.**
We need to find the height of the area of the trapezium to find its area, which we can find by Pythagoras theorem as the parallel part of the longer side will be equal to the shorter part opposite to it when a perpendicular will be drawn as the height of the trapezium.
Given that the lengths of the parallel sides of a trapezium are 51 cm and 21 cm, and that of each of the other two sides is 39 cm as shown in the figure, :
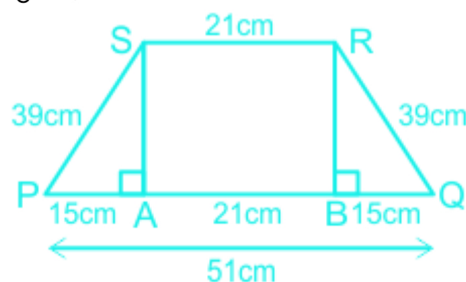
In a right-angled triangle PAS,
Using Pythagoras theorem
$(PS)^2 = (PA)^2 + (AS)^2$
$(39)^2 = (15)^2 + (AS)^2$
$AS = \sqrt{(1521 - 225)} = \sqrt{1296} = 36$ cm
Area of the trapezium = 1/2(Sum of parallel sides) × Height
$= 1/2 × (72) × 36 = 1296$ cm^2

Q:8 The correct answer is **Option 5** i.e. **784 cm^2.**
Given,
Diameter of circle = 14 cm
So, the side of the square is 28 cm
AB = DC = CE = 28 cm
Now,
The area of the triangle = 1/2 × CE × BC
$\Rightarrow 1/2 × 56 × 28 = (28 × 28) = 784$ cm^2

Q:9 The correct answer is **Option 5** i.e. **$3\sqrt{3} : 4$.**
Suppose the radius of the sphere and hemisphere are R and r respectively
According to the question:
$\Rightarrow 4\pi R^2 = 3\pi r^2$
$\Rightarrow R^2/r^2 = 3/4$
$\Rightarrow R/r = \sqrt{3}/2$
Hence,
Ratio of volumes = $4/3\pi R^3 : 2/3\pi r^3$
$\Rightarrow 2 × (R/r)^3$
$\Rightarrow 2 × (\sqrt{3}/2)^3 = 2 × 3\sqrt{3}/8 = 3\sqrt{3}/4$

Q:10 The correct answer is **option 1** i.e. **$64(\sqrt{3} + 1)$m^2.**
Now as by the structure of pyramid we can see that each side of triangular face is equal to side of base square, hence each side of triangular face = 8 m
Now, The total surface area of pyramid = Area of base + Sum of Surface areas of all triangular faces.
$= 8^2 + 4 (\sqrt{3}/4 × 8^2)$
$= 64 + 4(\sqrt{3}/4 × 64)$
$= 64 + \sqrt{3} × 64$
$= 64(\sqrt{3} + 1)$m^2