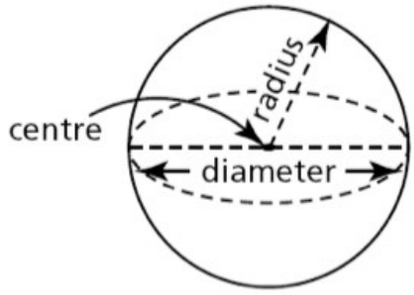
Spheres

Sphere = the set of points that are the same distance away from a fixed point, which is the centre.

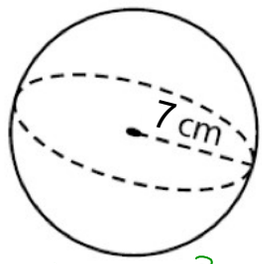


$$SA = 4\pi r^2$$

$$V = \frac{4}{3}\pi r^3$$

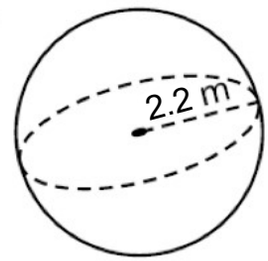
Ex. 1 Find the surface area of each sphere:

a)



$SA = 4\pi(7)^2$
$= 615.75\ cm^2$

b)



$SA = 4\pi(2.2)^2$
$= 60.82\ m^2$

Ex 2.

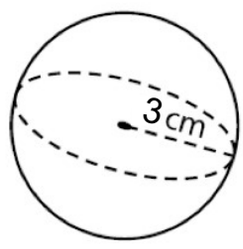
The diameter of a softball is approximately 4 in. Determine the surface area of a softball to the nearest square inch.

$r = 2\ in$

$SA = 4\pi(2)^2$
$= 50.27\ in^2$

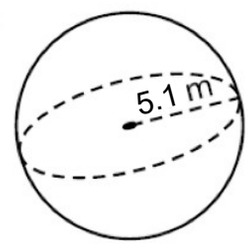
Ex 3. Find the volume of each sphere:

a)



$V = \frac{4\pi(3)^3}{3}$
$= 113.10\ cm^3$

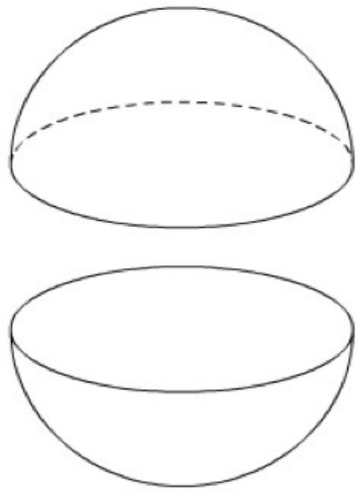
b)



$V = \frac{4\pi(5.1)^3}{3}$
$= 555.65\ m^3$

Hemispheres

When a sphere is cut in half, two *hemispheres* are formed.



hemispheres

SA = half a sphere + area of a circle

$= \frac{4\pi r^2}{2} + \pi r^2$

$= 2\pi r^2 + \pi r^2$

$= 3\pi r^2$

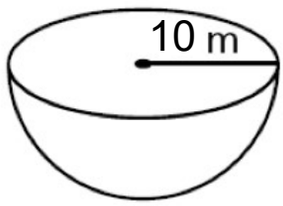
V= half a sphere

$V = \left(\frac{1}{2}\right)\left(\frac{4\pi r^3}{3}\right)$

$V = \frac{2\pi r^3}{3}$

Ex 4. Find the surface area and volume of each hemisphere:

a)



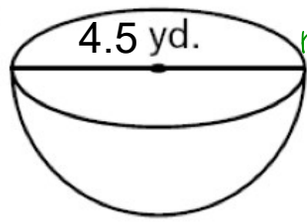
$SA = 3\pi(10)^2$

$= 942.48 m^2$

$V = \frac{2\pi(10)^3}{3}$

$= 2094.40 m^3$

b)



$r = 2.25$

$SA = 3\pi(2.25)^2$

$= 47.71 yd^2$

$V = \frac{2\pi(2.25)^3}{3}$

$= 23.86 yd^3$