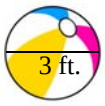
Lesson 10-8

Objective – To find the surface area and volume of spheres.

Surface Area of a Sphere

$SA = 4\pi r^2$

Find the amount of plastic sheeting needed to make a beach ball that is 3 feet in diameter



d = 3 ft.

r = 1.5 ft.

$SA = 4 \bullet \pi \bullet (r)^2$

$SA = 4 \bullet \pi \bullet (1.5)^2$

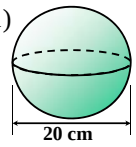
$SA = 4 \bullet (2.25) \bullet \pi$

$SA = 9\pi \approx 9(3.14)$

$SA \approx 28.26 \text{ ft}^2$

Find the surface area of the spheres below.

1)



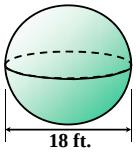
$SA = 4\pi r^2$

$SA = 4\pi \bullet (10)^2$

$SA = 4\pi \bullet 100$

$SA = 400\pi \approx 1256 \text{ cm}^2$

2)



$SA = 4\pi r^2$

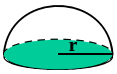
$SA = 4\pi \bullet (9)^2$

$SA = 4\pi \bullet 81$

$SA = 324\pi$

$SA \approx 1017.36 \text{ ft}^2$

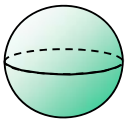
Find the surface area formula for a hemisphere.



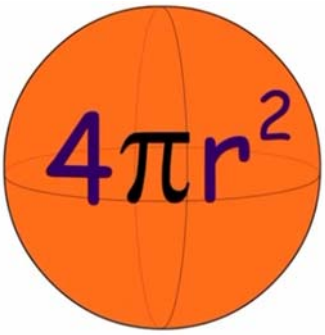
$SA_{\text{Top Hemisphere}} = 2\pi r^2$

$SA_{\text{Bottom Circle}} = \pi r^2$

$SA_{\text{Total}} = 3\pi r^2$



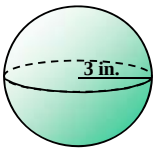
$SA = 4\pi r^2$



Volume of a Sphere

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

Find the volume of a sphere with a radius of 3 in.



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

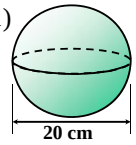
$V = \frac{4}{3}\pi \bullet 27$

$V = \frac{4}{3} \bullet \frac{27}{1} \bullet \pi$ (÷3)

$V = 36\pi \text{ un}^3 \approx 113.04 \text{ un}^3$

Find the volume of the spheres below.

1)



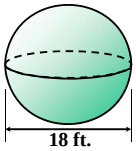
$V = \frac{4}{3}\pi \bullet r^3$

$V = \frac{4}{3}\pi \bullet (10)^3$

$V = \frac{4}{3}\pi \bullet 1000$

$V = \frac{4000}{3}\pi \approx 4186.67 \text{ cm}^3$

2)



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

$V = \frac{4}{3}\pi \bullet (9)^3$

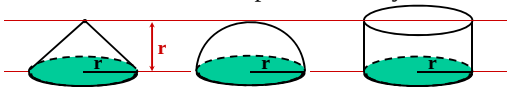
$V = \frac{4}{3}\pi \bullet 729$

$V = 972\pi$

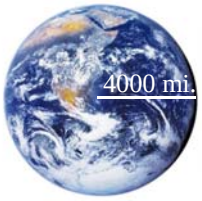
$V \approx 3052.08 \text{ ft}^3$

Lesson 10-8

Compare Cones, Hemispheres, Cylinders

Cone	Hemisphere	Cylinder
		
$V = \frac{1}{3} B \bullet Alt.$	$V = \frac{1}{2}\left(\frac{4}{3}\pi \bullet r^3\right)$	$V = B \bullet Alt.$
$V = \frac{1}{3}(\pi \bullet r^2) \bullet r$	$V = \frac{1}{2} \bullet \frac{4}{3}\pi \bullet r^3$ ($\div 2$)	$V = (\pi \bullet r^2) \bullet r$
$V = \frac{1}{3}\pi \bullet r^3$	$V = \frac{2}{3}\pi \bullet r^3$	$V = \pi \bullet r^3$
Equal to one cone	Equal to two cones	Equal to three cones

Estimate the volume of the Earth if it's radius is approximately 4000 miles.



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

$V = \frac{4}{3}\pi \bullet (4000)^3$

$V = \frac{4}{3} \bullet (6.4 \times 10^{10}) \bullet \pi$

$V = (8.53 \times 10^{10}) \bullet \pi$

$V \approx (8.53 \times 10^{10}) \bullet 3.14$

$V \approx 2.68 \times 10^{11}\ mi^3$