


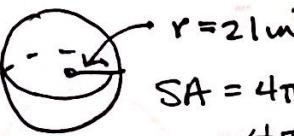
11.4 p. 771-773 (13-43) odd

13.  $V = \frac{4\pi r^3}{3} = \frac{4\pi(9)^3}{3} = \frac{2916\pi}{3} = \boxed{972\pi \text{ cm}^3}$

15. $V = \frac{4\pi r^3}{3}$
 $\frac{7776\pi}{1} = \frac{4\pi r^3}{3}$
 $23328\pi = 4\pi r^3$

$\frac{23328\pi}{4\pi} = r^3$
 $5832 = r^3$

$\sqrt[3]{5832} = r$
 or $(5832)^{\frac{1}{3}} = 18 \text{ in}$
 diameter = $\boxed{36 \text{ in}}$

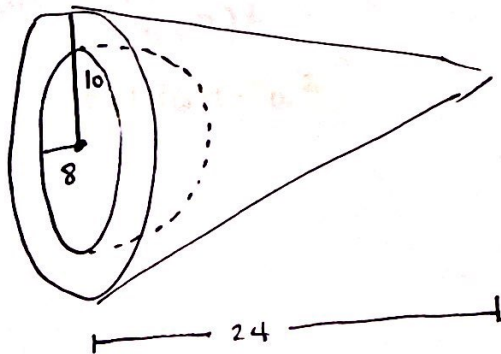
17.  $r = 21 \text{ in}$
 $SA = 4\pi r^2$
 $= 4\pi(21)^2$
 $= \boxed{1764\pi \text{ in}^2}$

19. $SA = 4\pi r^2$
 $\frac{625\pi}{4\pi} = \frac{4\pi r^2}{4\pi}$
 $\frac{625}{4} = r^2$
 $\sqrt{\frac{625}{4}} = r$
 $\frac{\sqrt{625}}{\sqrt{4}} = \frac{25}{2} = r$

$V = \frac{4\pi \left(\frac{25}{2}\right)^3}{3} = \frac{4\pi \left(\frac{15625}{8}\right)}{3} = \frac{15625\pi}{3}$
 $\frac{15625\pi}{2} \cdot \frac{1}{3} = \boxed{\frac{15625\pi}{6} \text{ m}^3}$

21. Since volume is units cubed if radius is mult. by 6, then new volume will be 6^3 times greater or $\boxed{216}$.

23. Conc - hemisphere



$V = \text{Cone} - \text{hemisphere}$
 $V = \frac{\pi r^2 h}{3} - \frac{1}{2} \left(\frac{4\pi r^3}{3} \right)$

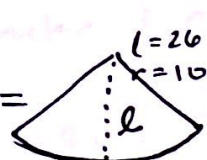
$= \frac{\pi r^2 h}{3} - \frac{2\pi r^3}{3}$

$= \frac{\pi(10)^2(24)}{3} - \frac{2\pi(8)^3}{3}$

$V = 800\pi - 341\frac{1}{3}\pi = \boxed{458\frac{2}{3}\pi \text{ mm}^3}$ or $\approx \boxed{1440.9 \text{ mm}^3}$

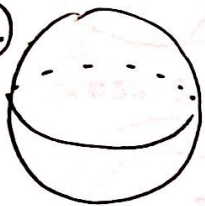
23. cont

Surface area =



$$\begin{aligned}
 &= \text{Lateral area of cone} + \frac{1}{2} \text{Surface area of sphere} + (\text{large } \odot \text{ Area} - \text{small } \odot \text{ Area}) \\
 &= \frac{1}{2} (2\pi r l) + \frac{1}{2} (4\pi r^2) + (\pi r^2 - \pi r^2) \\
 &= \pi r l + 2\pi r^2 + (\pi r^2 - \pi r^2) \\
 &= \pi (10)(26) + 2\pi (8)^2 + (\pi (10)^2 - \pi (8)^2) \\
 &= 260\pi + 128\pi + (36\pi) \\
 &= 424\pi \text{ mm}^2 \approx 1332.0 \text{ mm}^2
 \end{aligned}$$

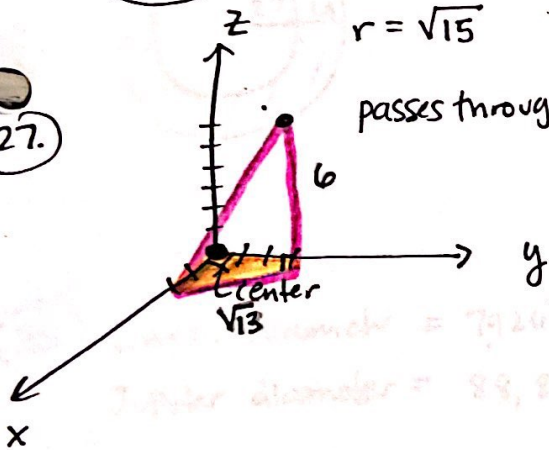
25.



$$\begin{aligned}
 SA &= 60\pi \\
 4\pi r^2 &= 60\pi \\
 r^2 &= 15 \\
 r &= \sqrt{15}
 \end{aligned}$$

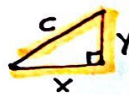
$$\begin{aligned}
 C &= 2\pi r \\
 &= 2\pi(\sqrt{15}) \text{ in}
 \end{aligned}$$

27.



passes through $(2, 3, 6)$

Since its 3-D use pythagorean Theorem twice to find radius



$$\begin{aligned}
 2^2 + 3^2 &= c^2 \\
 \sqrt{13} &= c
 \end{aligned}$$



$$\begin{aligned}
 \text{now } c^2 + z^2 &= r^2 \\
 (\sqrt{13})^2 + (6)^2 &= r^2 \\
 49 &= r^2 \\
 r &= 7
 \end{aligned}$$

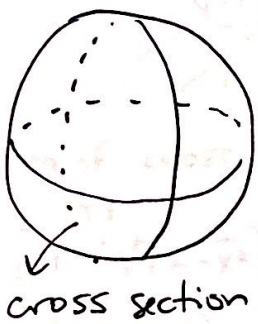
$$\begin{aligned}
 SA &= 4\pi r^2 \\
 &= 4\pi (7)^2
 \end{aligned}$$

$$= 196\pi \text{ u}^2$$

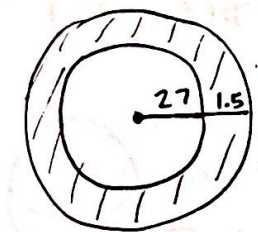
$$\begin{aligned}
 V &= \frac{4\pi r^3}{3} = \frac{4\pi (7)^3}{3} = \frac{1372\pi}{3} \text{ u}^3
 \end{aligned}$$

Sport	Diameter	$C = 2\pi r$	$SA = 4\pi r^2$	$V = \frac{4\pi r^3}{3}$
Golf	$d = 1.68$ in $r = .84$ in	$2\pi(.84)$ 5.28 in	$4\pi(.84)^2$ 8.87 in ²	$\frac{4\pi(.84)^3}{3}$ 2.48 in ³
Tennis	$d = 2.5$ in $r = 1.25$ in	$2\pi(1.25)$ 7.85 in	$4\pi(1.25)^2$ 19.63 in ²	$\frac{4\pi(1.25)^3}{3}$ 8.18 in ³

33



inside diameter
 $d = 54$ in
steel 1.5 in thick



cross section

Volume of steel

Large sphere (outside) - Smaller sphere (inside) - Volume of Window (cylinder)



$$= \frac{4\pi(28.5)^3}{3} - \frac{4\pi(27)^3}{3} - \pi(4)^2 \cdot 1.5$$

$$= 96966.83 - 82447.96 - 75.40$$

$$\approx 14442.97$$

$$\approx 14443 \text{ in}^3$$

35 Earth diameter = 7924 $r = 3963$
Jupiter diameter = 88,846 $r = 44423$

Jupiter Volume - Earth Volume

$$\frac{4\pi(44423)^3}{3} - \frac{4\pi(3963)^3}{3}$$

* Hint * → only need to calculate $(44423)^3$ and $(3963)^3$
the other parts are the same

$$\frac{(44423)^3}{(3963)^3} \approx 1408.5 \text{ times as great}$$

37 SA of Uranus = $4\pi(15881.5)^2$
SA of Neptune = $4\pi(15387.5)^2$
SA of Saturn = $4\pi(37449)^2$

$$4\pi(15881.5)^2 + 4\pi(15387.5)^2 \quad ? \quad 4\pi(37449)^2$$

$$4\pi(15881.5^2 + 15387.5^2) \quad ? \quad 4\pi(37449)^2$$

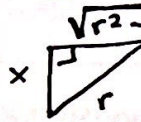
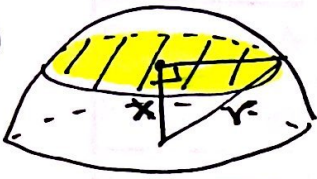
$$(15881.5)^2 + (15387.5)^2 < (37449)^2$$

(37) cont

$$488,997,198.5 < 1,402,427,601$$

SA of Saturn is greater

(39)

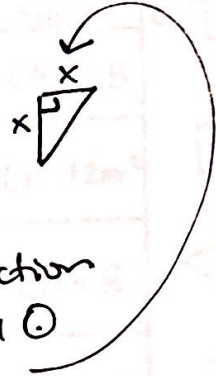
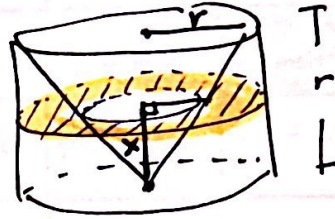


use pythagorean
thm

Area of cross section

$$= \pi r^2$$
$$= \pi (\sqrt{r^2 - x^2})^2$$

$$(r^2 - x^2)\pi$$



Area of cross section
large \odot - small \odot

$$= \pi r^2 - \pi r^2$$

$$= \pi r^2 - \pi x^2$$

$$= \pi (r^2 - x^2)$$

(41)



$$SA = 50.3 \text{ in}^2$$

Find radius

$$50.3 = 4\pi r^2$$

$$4.003 = r^2$$

$$r \approx 2.00$$

(a) $V = \frac{4\pi r^3}{3} = \frac{4\pi (2)^3}{3}$

$$\approx 33.5 \text{ in}^3$$

(b) increase radius by 10% new radius
 $2(1.10) = 2.2$

$$V = \frac{4\pi (2.2)^3}{3} \approx 44.6 \text{ in}^3$$

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

$$\frac{32\pi}{3} = \frac{4\pi r^3}{3}$$

$$32\pi = 4\pi r^3$$

$$8 = r^3$$

$$\sqrt[3]{8} = r$$

$$2 = r$$

$$SA = 4\pi r^2$$
$$= 4\pi (2)^2$$
$$= 16\pi \text{ in}^2$$

