

12.4

500/1-16, 19-22

R	① 7	② 5	③ $\frac{1}{2}$	④ $\frac{3}{4}k$	⑤ 4	⑥ 9	⑦ $\sqrt{2}$	⑧ 6
A	$196\pi$	$100\pi$	$\pi$	$\frac{9\pi k^2}{4}$	$64\pi$	$324\pi$	$8\pi$	$144\pi$
V	$\frac{1372\pi}{3}$	$\frac{520\pi}{3}$	$\frac{\pi}{6}$	$\frac{9\pi k^3}{16}$	$\frac{256\pi}{3}$	$972\pi$	$\frac{8\pi\sqrt{2}}{3}$	$288\pi$

1.  $A = 4\pi r^2$     ②  $A = 4\pi 5^2$     ③  $A = 4\pi \left(\frac{1}{2}\right)^2$     ④  $A = 4\pi \left(\frac{3}{4}k\right)^2$   
 $V = \frac{4}{3}\pi r^3$      $V = \frac{4}{3}\pi 5^3$      $V = \frac{4}{3}\pi \left(\frac{1}{2}\right)^3$      $V = \frac{4}{3}\pi \left(\frac{3}{4}k\right)^3$   
 $4\pi \frac{9}{16} k^2 = \frac{9\pi k^2}{4}$   
 $V = \frac{4}{3}\pi \left(\frac{3}{4}k\right)^3 = \frac{147\pi \cdot 27 k^3}{64 \cdot 16} = \frac{9\pi k^3}{16}$

⑤  $64\pi = 4\pi r^2$      $V = \frac{4}{3}\pi (4)^3$   
 $16 = r^2$

⑥  $324\pi = 4\pi r^2$      $V = \frac{4}{3}\pi (9)^3$   
 $81 = r^2$

⑦  $A = 4\pi (\sqrt{2})^2$      $V = \frac{4}{3}\pi (\sqrt{2})^3 = \frac{4}{3}\pi \cdot 2\sqrt{2}$

⑧  $288\pi = \frac{4}{3}\pi r^3$      $A = 4\pi \cdot 6^2$   
 $216 = r^3$

⑨  $A = 4\pi r^2 \rightarrow A = 4\pi (2r)^2 = 4\pi \cdot 4r^2 = 16\pi r^2$     • A is  $\times 4$   
 $V = \frac{4}{3}\pi r^3 \rightarrow V = \frac{4}{3}\pi (2r)^3 = \frac{32\pi r^3}{3}$     • V is  $\times 8$

⑩ • A is  $\times 9$   
 • V is  $\times 27$

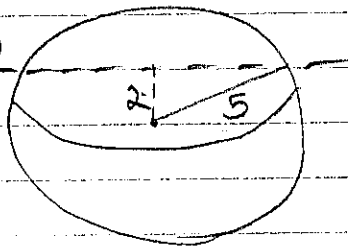
⑪  $\pi = 4\pi r^2$   
 $1 = 4r^2$   
 $\frac{1}{4} = r^2$

$\frac{1}{2} = r \rightarrow \boxed{1 = d}$

⑫  $36\pi = \frac{4}{3}\pi r^3$   
 $27 = r^3$   
 $3 = r$

$V = 4\pi 3^3$   
 $V = 36\pi$

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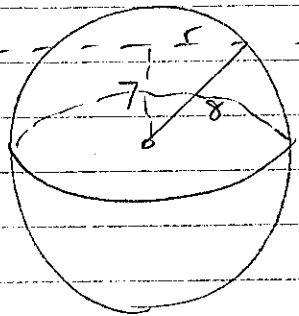
$$2^2 + r^2 = 5^2$$

$$r = \sqrt{21}$$

$$A = \pi (r^2)$$

$$A = 21\pi$$

14



$$7^2 + r^2 = 8^2$$

$$r = \sqrt{15}$$

$$A = \pi (r^2)$$

$$A = 15\pi$$

15

Sphere:  $V = \frac{4}{3}\pi (2)^3$

$$V = \frac{32\pi}{3}$$

Hemisphere:

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

$$= \frac{128\pi}{3}$$

4x the other

16

$$V_{\text{scoop}} = \frac{4}{3}\pi (3)^3$$

$$V_{\text{scoop}} = 36\pi$$

$$V_{\text{cone}} = \frac{1}{3} \cdot \pi (2.5)^2 \cdot 12$$

$$V_{\text{cone}} = 25\pi$$

No - not big enough

19

$$V_{\text{cyl}} = \pi \cdot 5^2 \cdot 20 = 800\pi$$

$$V_{\text{hemi}} = \frac{1}{2} \cdot \frac{4}{3}\pi (5)^3 = \frac{250\pi}{3}$$

$$\frac{500\pi + 250\pi}{3}$$

$$\frac{1500\pi + 250\pi}{3} = \frac{1750\pi}{3}$$

20

$$LA_{\text{cyl}} = \pi \cdot 10 \cdot 20 = 200\pi$$

$$A_{\text{hemi}} = \frac{1}{2} \cdot 4\pi \cdot 5^2 = 50\pi$$

$$\frac{2}{50\pi} = \frac{x}{200\pi}$$

$$x = 8 \text{ cans}$$

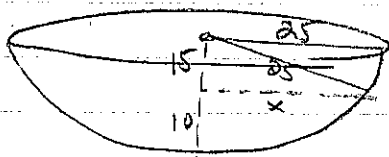
$$(21) \frac{3 \text{ cans}}{\pi r^2} = \frac{x}{\frac{1}{2}(4\pi r^2)}$$

$$\pi r^2 \cdot \frac{3}{\pi r^2} = \frac{x}{2\pi r^2} \cdot \pi r^2$$

$$2 \cdot 3 = \frac{x}{2}$$

$$\boxed{6 = x}$$

(22)



$$15^2 + x^2 = 25^2$$

$$x = 20$$

$$A = \pi (20)^2$$

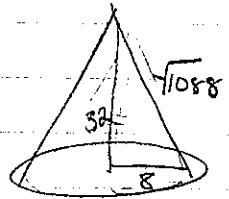
$$A = 400\pi$$

$$(23) V = \frac{4}{3}\pi (8)^3 \quad a) \quad \frac{2048\pi}{3} = \frac{1}{3}\pi (8)^2 \cdot h$$

$$V = \frac{2048\pi}{3}$$

$$2048 = 64h$$

$$\boxed{32 = h}$$



$$b) \quad LA_{\text{cone}} = \frac{1}{2} \pi (8) \cdot \sqrt{1088}$$

$$(LA_{\text{cone}} \approx 828.6)$$

$$\frac{828.6 - 803.84}{803.84} \approx 0.03 = \boxed{3\%}$$

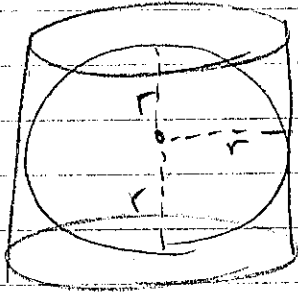
$$A_{\text{sph}} = 4\pi (8)^2$$

$$\approx 803.84$$

$$(24) V_{\text{balls}} = 6 \cdot \frac{4}{3}\pi r^3 = \frac{24\pi r^3}{3} = 8\pi r^3$$

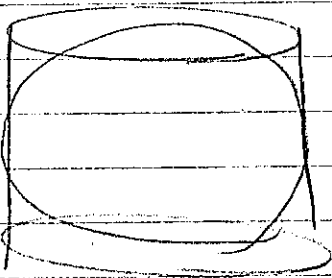
$$V_{\text{cyl}} = \pi r^2 \cdot 8r = 8\pi r^3$$

(25)



$$V = \pi r^2 \cdot 2r = 2\pi r^3$$

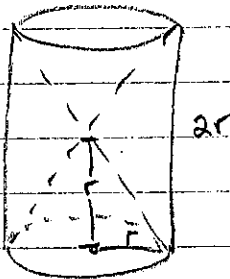
(26)



$$A_{\text{sph}} = 4\pi r^2 \quad A_{\text{cyl}} = 2\pi r \cdot 2r = 4\pi r^2$$

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

(27)

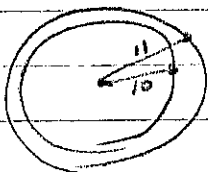


$$V_{\text{cyl}} = \pi r^2 (2r) = 2\pi r^3$$

$$V_{\text{cones}} = 2 \cdot \frac{1}{3} \pi r^2 \cdot r = \frac{2\pi r^3}{3}$$

$$2\pi r^3 - \frac{2\pi r^3}{3} = \boxed{\frac{4\pi r^3}{3}}$$

(28)

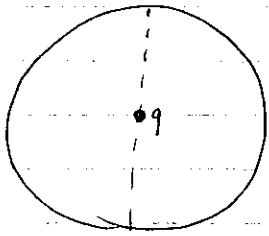


$$a) V = \frac{4}{3}\pi (11)^3 - \frac{4}{3}\pi (10)^3 = \frac{5324\pi}{3} - \frac{4000\pi}{3} = \frac{1324\pi}{3} \approx 1386 \text{ cm}^3$$

$$b) A = 4\pi (10)^2 = 400\pi \rightarrow 400\pi \cdot 1 \approx 1257 \text{ cm}^2$$

c) thin

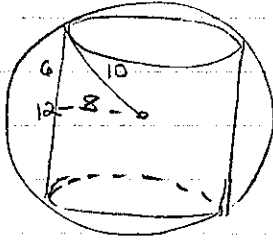
(29)



$$r = \frac{9}{2} \quad A = 4\pi \left(\frac{9}{2}\right)^2 = 81\pi$$

$$V = \frac{4}{3}\pi \left(\frac{9}{2}\right)^3 = \frac{2916\pi}{24} = \frac{243\pi}{2}$$

(30)



$$r = 8 \quad V = \pi(8)^2 \cdot 12$$

$$V = 768\pi$$

10

10

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