P.570 #16

d = 9

$LA = 2\pi rh$

$2\pi(4.5)(20)$

$LA = 180\pi$

$LA = Ph$

$= 12(20)$

$= 240$

$LA = 240$

X 2

$d = 9$

$\pi r^2 - 3^2$

$20.25\pi - 9$

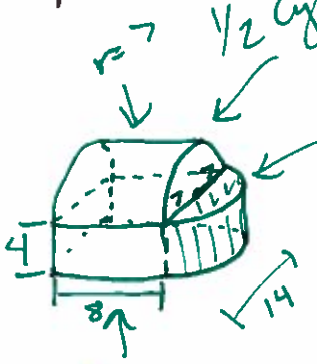
$180\pi + 240 + 2(20.25\pi - 9)$

$180\pi + 240 + 40.5\pi - 18$

$SA = 220.5\pi + 222 \text{ mm}^2$

$\approx 914.7 \text{ mm}^2$

#23 p.571



½ Top cylinder

$\frac{1}{2}(2B + Ph)$

$\frac{1}{2}(2\pi 7^2 + 2\pi(7)(8))$

$\frac{1}{2}(98\pi + 112\pi)$

$49\pi + 56\pi = 105\pi$

Rec Prism

Front = 32

Back = 32

Left = 56

bottom = 112

} 232

½ Side cylinder

$\frac{1}{2}(2\pi(7^2) + 2\pi(7)(4))$

$\frac{1}{2}(98\pi + 56\pi)$

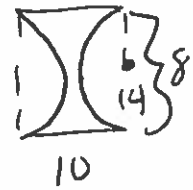
$\frac{1}{2}(154\pi) = 77\pi$

$182\pi + 232 \text{ cm}^2$

p.571 #24

Front 3 × 10 = $30\ in^2$

Back same as front $= 30\ in^2$

Top + Bottom $2 \times$ 

$10(8) = 80$

$-\pi(4^2)$

$= 80 - 16\pi$

$2(80-16\pi)$

$160 - 32\pi$

Curved sides total the lateral area of 1 cylinder

$2\pi rh = 2\pi(4)(3) = 24\pi$

$SA =$ $220 - 8\pi\ in^2$

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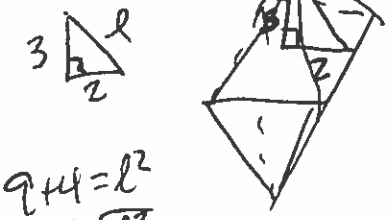
p.577 #11



$9+4=\ell^2$

$\sqrt{13}=\sqrt{\ell^2}$

$\sqrt{13}=\ell$

$SA = LA$ of 2 square pyramids

or can work as 8 Δ's

1 pyramid LA $\hookrightarrow \frac{1}{2}P\ell = \frac{1}{2}(16)(\sqrt{13})$

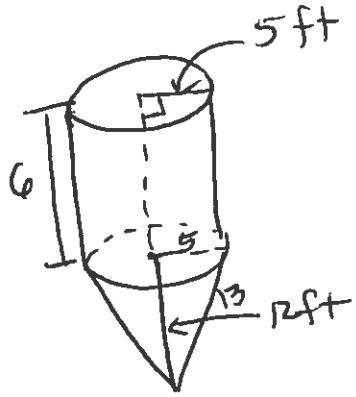
$8\sqrt{13}$

$2(8\sqrt{13}) = 16\sqrt{3}\ m^2$ for all 8 Δ's together

Exact Answer

$\approx 28\ m^2$

P. 577 #12



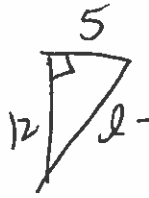
SA = Circle from top = 25π

$2\pi(5)(6)$ + LA of cylinder = 60π

$\pi(5)(13)$ + LA of cone = 65π

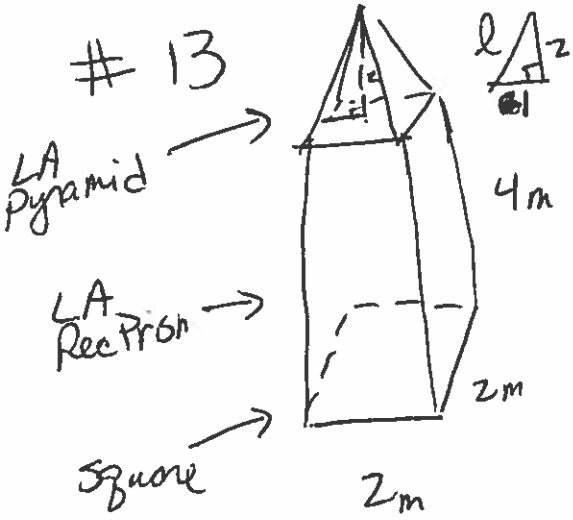
Total SA = 150π ft^2

≈ 471 ft^2



$\ell \rightarrow \ell = 13$

13



$\ell = \sqrt{5}$

top is LA pyramid

$\frac{1}{2}P\ell = \frac{1}{2}(8)(\sqrt{5})$

Top $= 4\sqrt{5}$

middle $= Ph = 8(4) = 32$

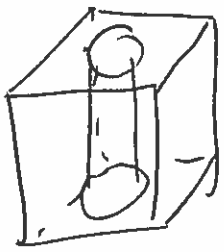
bottom $= 2(2) = 4$

$36 + 4\sqrt{5}$ m^2 Exact

≈ 45 m^2

p. 578 #16

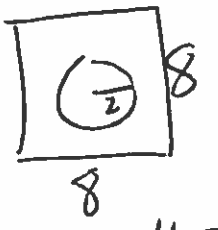
Cube Cylinder Hole



Top + Bottom

$2(64-4\pi)$

$128-8\pi$



$64-4\pi$

+

LA Cylinder

$2\pi(2)(8)$

32π

+

LA Cube

Ph

$32(8)$

256

$128-8\pi+32\pi+256$

$384+24\pi$ ft^2

$\approx 459.398\ldots$ ft^2

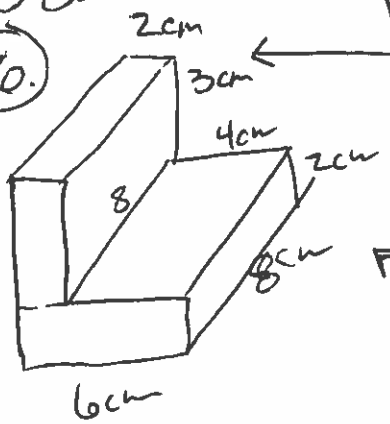
$\div 130$ per can

3.53 cans

Would need to buy 4 cans

P.582

(6.)



Volume

Rec Prism ← $V = Bh$

$= 2(3)(8)$

$= 96$

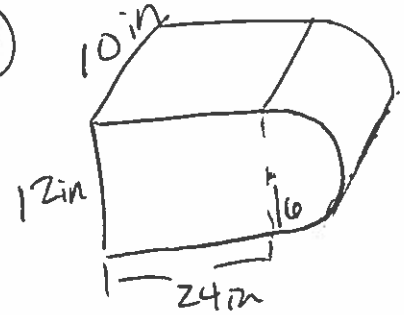
Rec Prism ←

$6(8)(2) = 96$

Total = 192cm^3

---

(7)



Rec Prism + $\frac{1}{2}$ Cylinder

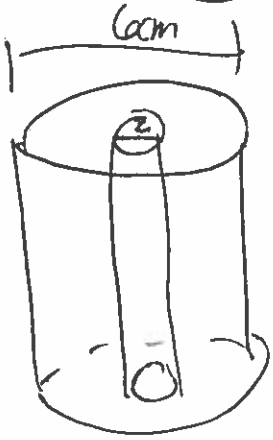
$12(24)(10) + \frac{1}{2}\pi(6^2)$

$= 2880 + 18\pi$ ← Exact

$\approx 2937\text{in}^3$ ← nearest whole #

(17.)

P.583 #18



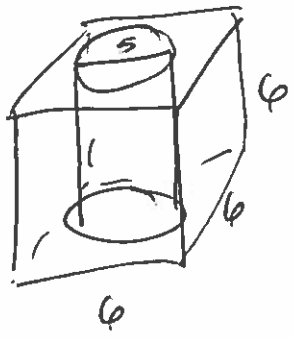
Big Cylinder - Sm cylinder

$\pi(3^2)(5)$ $-\pi(1^2)(5)$

45π $-$ 5π

$40\pi cm^3$ | $125.7 cm^3$

(19.)



Cube $6^3 = 216$

$-$

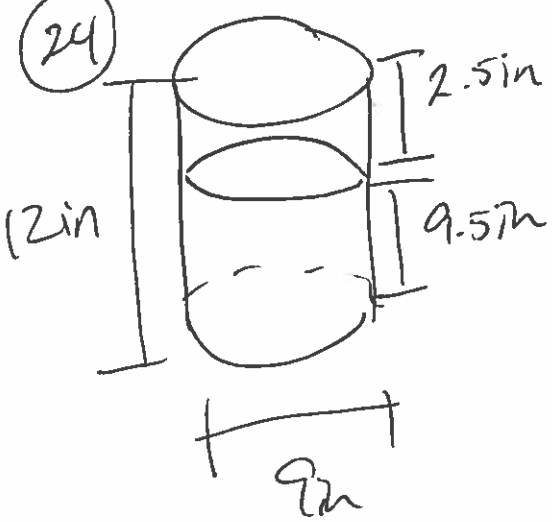
cylinder $\pi(2.5^2)(6) = 37.5\pi$

$216 - 37.5\pi$

| $98.2 in^3$ |

---

(24)

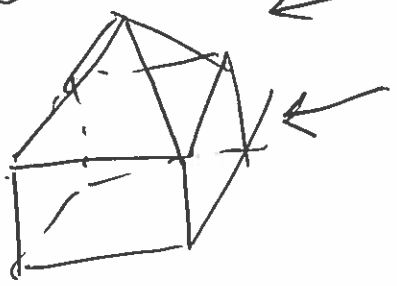


$\pi(4.5^2)(9.5)$

192.375π

604.36 (A)

P.588 #11



$\frac{1}{3}(24)(24)(9) = 1728$

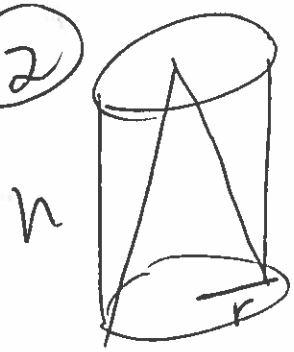
$+$ $+$

$24(24)(15) = 8640$

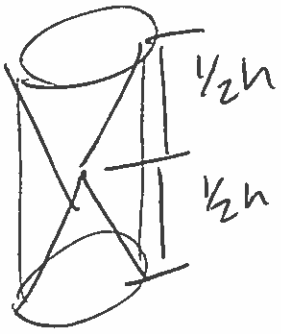
10,368 ft³

---

12)



$\frac{1}{3}\pi r^2 h$



$2\left(\frac{1}{3}\pi r^2(\frac{1}{2}h)\right)$

$2\left(\frac{1}{6}\pi r^2 h\right)$

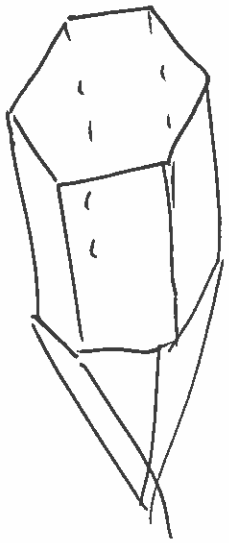
$\frac{2}{6}\pi r^2 h$

$\frac{1}{3}\pi r^2 h$

They are the same

---

14)



Hexagonal Prism $= Bh = 6\sqrt{3}(6) = 36\sqrt{3}$

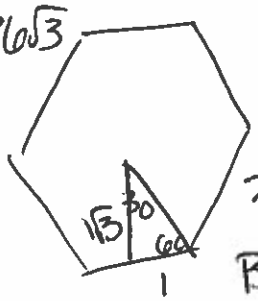
$+$

Hexagonal Pyramid

$\frac{1}{3}Bh$

$\frac{1}{3}(6\sqrt{3})(3)$

$6\sqrt{3}$



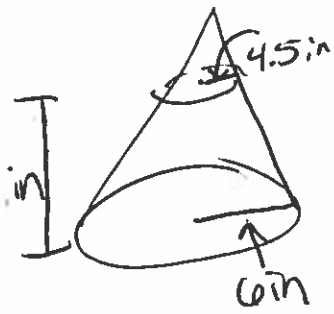
$\frac{\sqrt{3}(12)}{2} = 6\sqrt{3}$

$36\sqrt{3} + 6\sqrt{3} = 42\sqrt{3}\ cm^3$ Exact

$\approx 73\ cm^3$ nearest cm^3

P.589 #17

a) $\frac{1}{3}\pi R^2 H - \frac{1}{3}\pi r^2 h$



b) Frustum formula

$$V = \frac{1}{3}h(B_1 + B_2 + \sqrt{B_1 \cdot B_2})$$

$$= \frac{1}{3}(9)(20.25\pi + 36\pi + \sqrt{20.25\pi \cdot 36\pi})$$

$$= 3(56.25\pi + \sqrt{729\pi^2})$$

$$= 3(56.25\pi + 27\pi)$$

$$= 3(83.25\pi)$$

$$= \boxed{249.75\pi \text{ in}^3}$$

$$\approx 784.4$$

P.594 #20

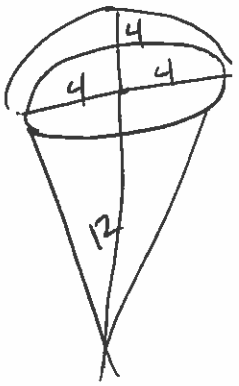
cube − sphere

$6^3 - \frac{4}{3}\pi(3)^3$

$216 - 36\pi$

C. 102.9 in³

#28



Cone $V = \frac{1}{3}\pi(4^2)(12)$

Cone $V = 64\pi$

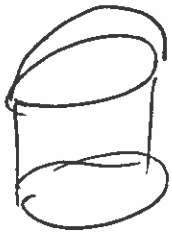
Sphere $\frac{4}{3}\pi(4^3)$

85.33π

Sphere is bigger than cone so if melted would not fit in cone.

It would overflow.

#31



hemisphere

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

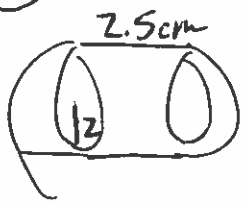
$= 5\frac{1}{3}\pi$

Cylinder $\pi(2^2)(2.5)$

10π

Total **$15\frac{1}{3}\pi\ cm^3$**

#32



Cylinder + sphere

$\pi(2^2)(2.5) + \frac{4}{3}\pi(2^3)$ ← Both ends make 1 sphere.

$10\pi + 10\frac{2}{3}\pi$

$20\frac{2}{3}\pi\ cm^3$