WS - UNIT 7 TEST REVIEW

#1 $V = 2304\pi$

$2304\pi = \frac{4}{3}\pi r^3$

$2304 = \frac{4}{3} r^3$

$1728 = r^3$

$r = \sqrt[3]{1728} = 12$

$SA = 4\pi r^2$

$= 4\pi(12)^2$

$= 576\pi \text{ u}^2$

#2 $C_{\text{GREAT CIRCLE}} = 18\pi$

$18\pi = 2\pi r$

$r = 9$

$SA = 4\pi r^2$

$= 4\pi(9)^2$

$= 324\pi \text{ u}^2$

#3 $r = 7$ cm

$SA = 4\pi(7)^2 = 196\pi$

$V = \frac{4}{3}\pi(7)^3 = \frac{1372}{3}\pi$

r IS TRIPLED

$SA \times 9 = 1764 \text{ cm}^2$

$V \times 27 = 12348\pi \text{ cm}^3$

#4 $SA = 2B + Ph$

$= 2(18 \cdot 7) + (18+7+18+7)(12)$

$= 2(126) + 50(12)$

$= 252 + 600$

$= 852 \text{ cm}^2$

$V = Bh$

$= (18 \cdot 7)(12)$

$= (126)(12)$

$= 1512 \text{ cm}^3$

#5 $SA = 2\pi r^2 + Ch$

$= 2\pi(3)^2 + 6\pi(11)$

$= 18\pi + 66\pi$

$= 84\pi \text{ m}^2$

$V = \pi r^2 h$

$= \pi(3)^2(11)$

$= \pi(9)(11)$

$= 99\pi \text{ m}^3$

#6 AREA OF BASE

$A_\Delta = \frac{1}{2}bh$

$= \frac{1}{2}(14)(7\sqrt{3})$

$= 49\sqrt{3}$

$SA = 2B + Ph$

$= 2(49\sqrt{3}) + (14+14+14)(23)$

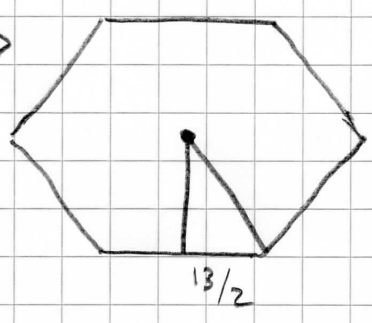
$= 98\sqrt{3} + 966 \text{ in}^2$

$V = Bh$

$= (49\sqrt{3})(23)$

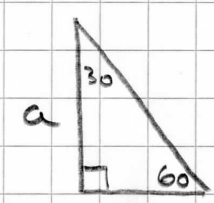
$= 1127\sqrt{3} \text{ in}^3$

#7 AREA OF BASE ⟹



HEXAGON: $\frac{(n-2)\cdot 180}{n} = \frac{4\cdot 180}{6}$

$= 120$



$a = \frac{13}{2}\sqrt{3}$

$A = \frac{1}{2}aP$

$= \frac{1}{2}\left(\frac{13}{2}\sqrt{3}\right)(78)$

$= \frac{507}{2}\sqrt{3}$

$SA = 2B + Ph$

$= 2\left(\frac{507}{2}\sqrt{3}\right) + (78)(27)$

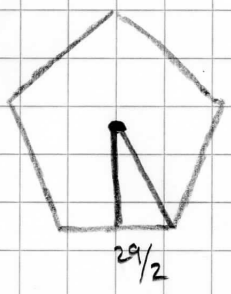
$= 507\sqrt{3} + 2106 \text{ ft}^2$

$V = Bh$

$= \left(\frac{507}{2}\sqrt{3}\right)(27)$

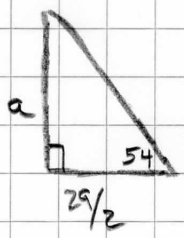
$= \frac{13669}{2}\sqrt{3} \text{ ft}^3$

#8 AREA OF BASE



PENTAGON: $\frac{(n-2)\cdot 180}{n} = \frac{3\cdot 180}{5}$

$= 108°$



$\tan 54 = \frac{a}{29/2}$

$a = \frac{29}{2}\tan 54$

$A = \frac{1}{2}aP$

$= \frac{1}{2}\left(\frac{29}{2}\tan 54\right)(145)$

$= \frac{4205}{4}\tan 54$

$SA = 2B + Ph$

$= 2\left(\frac{4205}{4}\tan 54\right) + (145)(32)$

$= \frac{4205}{2}\tan 54 + 4640$

$\approx 7533.84 \text{ mm}^2$

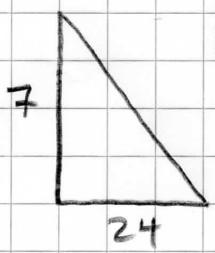
$V = Bh$

$= \left(\frac{4205}{4}\tan 54\right)(32)$

$= 33640 \tan 54$

$\approx 46301.49 \text{ mm}^3$

#9 SLANT HEIGHT



$\ell^2 = 7^2 + 24^2$

$\ell = 25$

$SA = B + \frac{1}{2}P\ell$

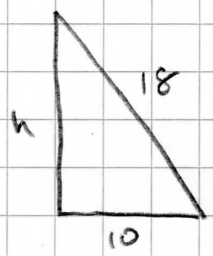
$= (48)(48) + \frac{1}{2}(48.4)(25)$

$= 2304 + 2400 = 4704 \text{ u}^2$

$V = \frac{1}{3}Bh$

$= \frac{1}{3}(48.48)(7) = 5376 \text{ u}^3$

#10 HEIGHT



$h^2+10^2=18^2$

$h^2=224$

$h=4\sqrt{14}$

$SA = B+\frac{1}{2}Cl$

$= \pi r^2+\frac{1}{2}(2\pi r)l$

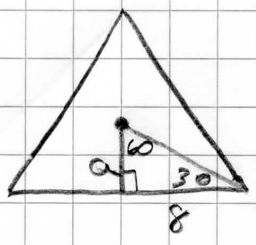
$= \pi(10)^2+\frac{1}{2}(2\pi 10)18$

$= 100\pi+180\pi = 280\pi \text{ u}^2$

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

$=\frac{1}{3}\pi(10)^2(4\sqrt{14}) = \frac{400}{3}\pi\sqrt{14} \text{ u}^3$

#11 AREA OF BASE



$LL = SL\sqrt{3}$

$8 = a\sqrt{3}$

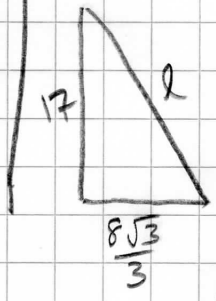
$a=\frac{8}{\sqrt{3}}=\frac{8\sqrt{3}}{3}$

$A=\frac{1}{2}aP$

$=\frac{1}{2}\left(\frac{8\sqrt{3}}{3}\right)(48)$

$=64\sqrt{3}$

SLANT HEIGHT



$l^2=17^2+\left(\frac{8\sqrt{3}}{3}\right)^2$

$=289+\frac{64}{3}$

$=\frac{931}{3}$

$l=\frac{\sqrt{931}}{\sqrt{3}}=\frac{7\sqrt{57}}{3}$

$SA = B+\frac{1}{2}Pl$

$=64\sqrt{3}+\frac{1}{2}(48)\left(\frac{7\sqrt{57}}{3}\right)$

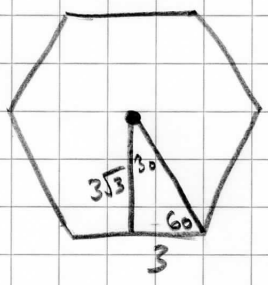
$=64\sqrt{3}+56\sqrt{57} \text{ u}^2$

$V=\frac{1}{3}Bh$

$=\frac{1}{3}(64\sqrt{3})(17)$

$=\frac{1088}{3}\sqrt{3} \text{ u}^3$

#12 AREA OF BASE



$A=\frac{1}{2}aP$

$=\frac{1}{2}(3\sqrt{3})(36)$

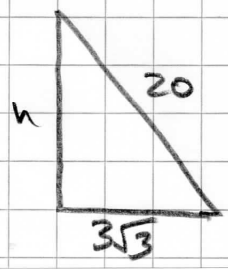
$=54\sqrt{3}$

$SA = B+\frac{1}{2}Pl$

$=54\sqrt{3}+\frac{1}{2}(36)(20)$

$=54\sqrt{3}+360 \text{ u}^2$

HEIGHT



$h^2+(3\sqrt{3})^2=20^2$

$h^2+27=400$

$h=\sqrt{373}$

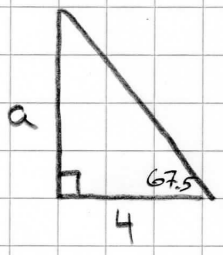
$V=\frac{1}{3}Bh$

$=\frac{1}{3}(54\sqrt{3})(\sqrt{373})$

$=18\sqrt{1119} \text{ u}^3$

#13 AREA OF BASE

OCTAGON $\Rightarrow \frac{(n-2)\cdot 180}{n} = \frac{6\cdot 180}{8} = 135$



$\tan 67.5 = \frac{a}{4}$

$a = 4\tan 67.5$

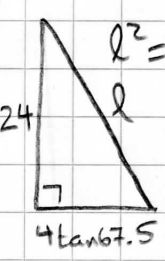
$A = \frac{1}{2}aP$

$= \frac{1}{2}(4\tan 67.5)(64)$

$= 128\tan 67.5$

≈ 309.02

SLANT HEIGHT



$l^2 = 24^2 + (4\tan 67.5)^2$

$l^2 = 669.255$

$l \approx 25.87$

$SA = B + \frac{1}{2}Pl$

$= 309.02 + \frac{1}{2}(64)(25.87)$

$\approx 1136.86 \text{ u}^2$

$V = \frac{1}{3}Bh$

$= \frac{1}{3}(309.02)(24)$

$\approx 2472.15 \text{ u}^3$

#14 $SA = B_{CYL} + LA_{CYL} + SA_{HEMI}$

$= \pi r^2 + 2\pi rh + \frac{1}{2}(4\pi r^2)$

$= \pi(6)^2 + 2\pi(6)(4) + 2\pi(6)^2$

$= 36\pi + 48\pi + 72\pi$

$= 156\pi \text{ cm}^2$

$V = V_{CYL} + V_{HEMI}$

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

$= \pi(6)^2(4) + \frac{2}{3}\pi(6)^3$

$= 144\pi + 144\pi$

$= 288\pi \text{ cm}^3$

#15 $SA = SA_{PRISM} - 2(A_{CIRCLE}) + LA_{CYL}$

$= (2B + Ph) - 2\pi r^2 + 2\pi rh$

$= 2(5.6) + 22(1) - 2\pi(1)^2 + 2\pi(1)(1)$

$= 60 + 22 - 2\pi + 2\pi$

$= 82 \text{ cm}^2$

$V = V_{PRISM} - V_{CYL}$

$= Bh - \pi r^2 h$

$= (30)(1) - \pi(1)^2(1)$

$= 30 - \pi \text{ cm}^3$

#16 SLANT HEIGHT

$l^2 = 6^2 + 17^2$

$l^2 = 36 + 289$

$l^2 = 325$

$l = 5\sqrt{13}$

$SA = SA_{HEMI} + LA_{CONE}$

$= \frac{1}{2}(4\pi r^2) + \frac{1}{2}(2\pi r)l$

$= 2\pi(6)^2 + \pi(6)(5\sqrt{13})$

$= 72\pi + 30\pi\sqrt{13} \text{ ft}^2$

$V = V_{HEMI} + V_{CONE}$

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

$= \frac{2}{3}\pi(6)^3 + \frac{1}{3}\pi(6)^2(17)$

$= 144\pi + 204\pi$

$= 348\pi \text{ ft}^3$

#17 $SA = SA_{PRISM} - 2(A_{SQUARE}) + LA_{INSIDE\ PRISM}$

$= (2B + Ph) - 2(s^2) + Ph$

$= 2(16) + 16(3) - 2(2^2) + 8(3)$

$= 32 + 48 - 8 + 24$

$= 96\ ft^2$

$V = V_{OUTER\ PRISM} - V_{INNER\ PRISM}$

$= Bh - Bh$

$= (4^2)(3) - (2^2)(3)$

$= 48 - 12$

$= 36\ ft^3$

#18 $SA = B_{CYL} + LA_{CYL} + SA_{HEMI}$

$= \pi r^2 + 2\pi rh + \frac{1}{2}(4\pi r^2)$

$= \pi(3)^2 + 2\pi(3)(9) + 2\pi(3)^2$

$= 9\pi + 54\pi + 18\pi$

$= 81\pi\ in^2$

$V = V_{CYL} - V_{HEMI}$

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

$= \pi(3)^2(9) - \frac{2}{3}\pi(3)^3$

$= 81\pi - 18\pi$

$= 63\pi\ in^3$

#19 $SA = SA_{CYL} - 2(A_{CIRCLES}) + LA_{CYL}$

$= (2B + 2\pi rh) - 2(\pi r^2) + 2\pi rh$

$= 2\pi(3)^2 + 2\pi(3)(10) - 2\pi(1)^2 + 2\pi(1)(10)$

$= 18\pi + 60\pi - 2\pi + 20\pi$

$= 96\pi\ m^2$

$V = V_{OUTER\ CYL} - V_{INNER\ CYL}$

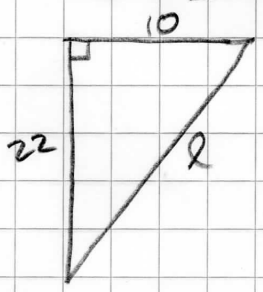
$= \pi r^2 h - \pi r^2 h$

$= \pi(3)^2(10) - \pi(1)^2(10)$

$= 90\pi - 10\pi$

$= 80\pi\ m^3$

#20 OUTER SLANT HEIGHT

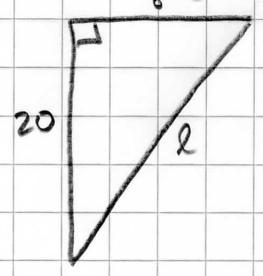


$\ell^2 = 10^2 + 22^2$

$\ell^2 = 584$

$\ell = 2\sqrt{146}$

INNER SLANT HEIGHT



$\ell^2 = 8^2 + 20^2$

$\ell^2 = 464$

$\ell = 4\sqrt{29}$

$SA = SA_{OUTER\ CONE} - A_{CIRCLE} + LA_{INNER\ CONE}$

$= (\pi r^2 + \frac{1}{2} \cdot 2\pi r\ell) - \pi r^2 + \frac{1}{2} 2\pi r\ell$

$= \pi(10)^2 + \pi(10)(2\sqrt{146}) - \pi(8)^2 + \pi(8)(4\sqrt{29})$

$= 100\pi + 20\pi\sqrt{146} - 64\pi + 32\pi\sqrt{29}$

$= 36\pi + 20\pi\sqrt{146} + 32\pi\sqrt{29}\ cm^2$

$V = V_{OUTER\ CONE} - V_{INNER\ CONE}$

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

$= \frac{1}{3}\pi(10)^2(22) - \frac{1}{3}\pi(8)^2(20)$

$= \frac{2200}{3}\pi - \frac{1280}{3}\pi$

$= \frac{920}{3}\pi$

#21 SLANT HEIGHT

$\ell^2 = 2^2 + 6^2$

$\ell^2 = 40$

$\ell = 2\sqrt{10}$

$SA = SA_{PRISM} - A_{CIRCLE} + LA_{CONE}$

$= (2B + Ph) - \pi r^2 + \frac{1}{2} 2\pi r \ell$

$= 2(36) + 24(6) - \pi(2)^2 + \pi(2)(2\sqrt{10})$

$= 72 + 144 - 4\pi + 4\pi\sqrt{10}$

$= 216 - 4\pi + 4\pi\sqrt{10}$ mm^2

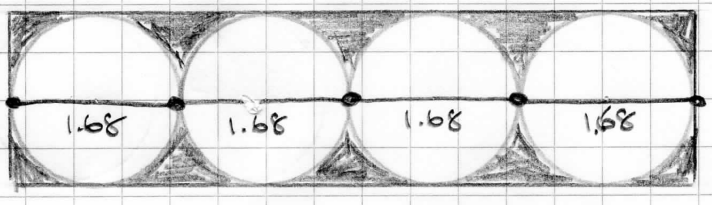
$V = V_{PRISM} - V_{CONE}$

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

$= (36)(6) - \frac{1}{3}\pi(2)^2(6)$

$= 216 - 8\pi$ mm^3

#22 GOLF BALL DIAMETER = 1.68 IN $\Rightarrow r = 0.84$



$SA = 4\pi(0.84)^2 = 2.8224\pi$ in^2

≈ 8.867 in^2

$V = \frac{4}{3}\pi(0.84)^3 = 0.790272\pi$ in^3

≈ 2.483 in^3

$V_{SHADED\ REGION} = V_{PRISM} - V_{4\ GOLF\ BALLS}$

$= Bh - 4(0.790272\pi)$

$= (1.68 \cdot 1.68)(4 \cdot 1.68) - 3.161088\pi$

$= (2.8224)(6.72) - 3.161088\pi$

$= 18.966528 - 3.161088\pi$

≈ 9.036 in^3