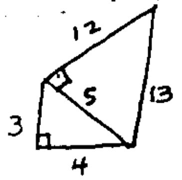
8 Plant

GEOMETRY TEAM SOLUTIONS

MARCH 1997

$\boxed{36}$ 1.

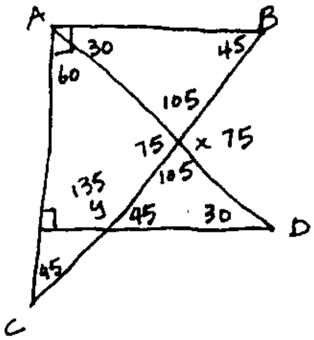


A sm $\Delta = \frac{1}{2}\cdot 3\cdot 4 = 6$

A lg $\Delta = \frac{1}{2}\cdot 12\cdot 5 = 30$

$6+30=36$

$\boxed{210^\circ}$ 2.



$x+y=210$

$\boxed{-12}$ 3. complete the square

$x^2+6x+9+y^2+4y+4=12+9+4$

$(x+3)^2+(y+2)^2=25$

$C=(-3,-2)$

$r=5$

$h=-3,\ K=-2,\ r=5$

$(-3)^2+(-2)^2-(5)^2$

-12

$\boxed{60\pi}$ 4. $V=\frac{1}{b}\cdot B\cdot h$

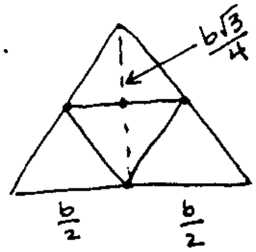
$V=\frac{1}{b}\cdot 36\pi\cdot 10$

$V=60\pi$

$\boxed{23.5\%}$ 5. $81\pi \rightarrow 100\pi$

$\frac{19}{81}\approx 23.5\%$

$\boxed{60}$ 6.



A of lg $\Delta = 100\sqrt{3}$

A lg $\Delta = \frac{1}{2}\cdot b\left(\frac{b\sqrt{3}}{2}\right)$

$=\frac{1}{4}b^2\sqrt{3}$

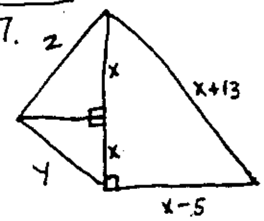
$100\sqrt{3}=\frac{1}{4}b^2\sqrt{3}$

$400=b^2$

$20=b$

$P=20\cdot 3=60$

$\boxed{12+24\sqrt{2}}$ 7.



$(2x)^2+(x-5)^2=(x+13)^2$

$4x^2+x^2-10x+25=x^2+26x+169$

$4x^2-36x-144=0$

$4(x^2-9x-36)=0$

$4(x-12)(x+3)=0$

$x=12, \cancel{-3}$

$x=12$

$y=12\sqrt{2}$

$z=12\sqrt{2}$

$x+y+z=12+24\sqrt{2}$

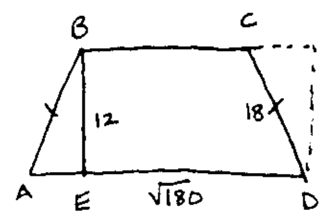
$\boxed{1}$ 8. $\pi r^2=\frac{1}{2}(2\pi r)$

$r^2=r$

$r(r-1)=0$

$r=0\ \ r=1$

$\boxed{72\sqrt{5}}$ 9.



$12^2+ED^2=18^2$

$ED^2=324-144$

$ED=\sqrt{180}$

Area of Parallelogram $=12\sqrt{180}$

$72\sqrt{5}$

$\boxed{7}$ 10. $a+b+6=14$

$a+b=8$

$a^2+b^2=36$

$(a+b)^2=8^2$

$a^2+2ab+b^2=64$

SUBS.

$a^2+b^2+2ab=64$

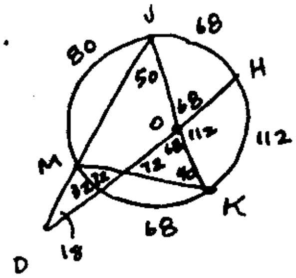
$36+2ab=64$

$2ab=28$

$ab=14$

$A=\frac{1}{2}ab=14\cdot\frac{1}{2}=7$

$\boxed{140^\circ}$ 11.



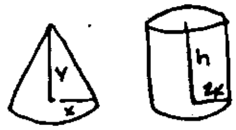
$z = 72$

$x = 18$

$\underline{y = 50}$

140

$\boxed{\frac{y}{12}}$ 12.



$V = \frac{1}{3} B \cdot h \qquad V = B \cdot h$

$V = \frac{1}{3} \cdot \pi r^2 \cdot y \qquad V = \pi r^2 \cdot h$

$\frac{1}{3} \pi r^2 \cdot y = \pi (2x)^2 \cdot h$

$\frac{1}{3} y = 4h$

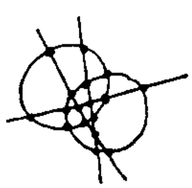
$\frac{1}{12} y = h$

$\boxed{350}$ 13. by trial and error and using Heron's formula you find an isosceles Δ yields the maximum area

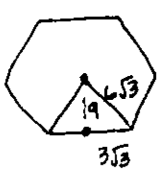
$A = \sqrt{47.5\,(28.5)(9.5)(9.5)}$

$A = 349.5 \approx 350$

$\boxed{17}$ 14.



$\boxed{162\sqrt{3}}$ 15.



$A = \frac{1}{2} \cdot 9 \cdot 36\sqrt{3}$

$A = 162\sqrt{3}$