Geom Team 3/14/98

13\. First, find the point of intersection

$x^2+y^2-10x+25 = 41-20\sqrt{2}$

10

$16 + 25 - 10x = 41 - 20\sqrt{2}$

$-10x = -20\sqrt{2}$

$x = 2\sqrt{2}$

on $x^2+y^2=16$ at $x=2\sqrt{2}$, $y=2\sqrt{2}$,

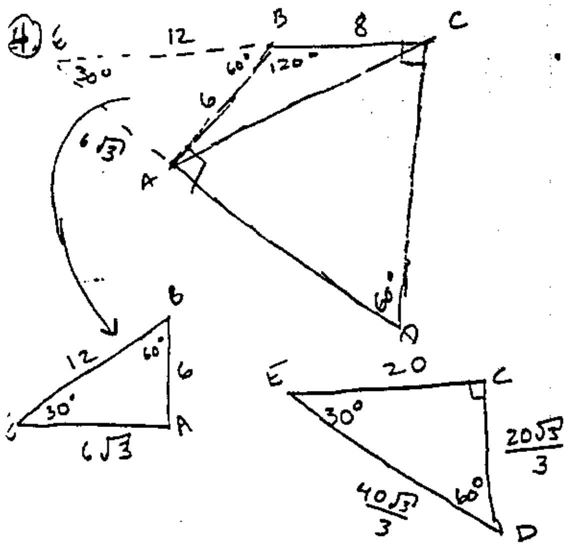
so slope of tangent line is -1.

$\therefore\ y-2\sqrt{2} = -1(x-2\sqrt{2})$

$y-2\sqrt{2} = -x+2\sqrt{2}$

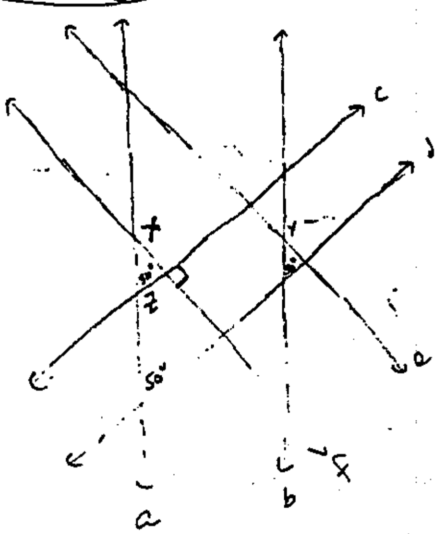
$x+y-4\sqrt{2}=0$

4\.



$\therefore\ CD = \frac{20\sqrt{3}}{3}$

1\.



$Y = 180° - (180° - (50° + 90°))$

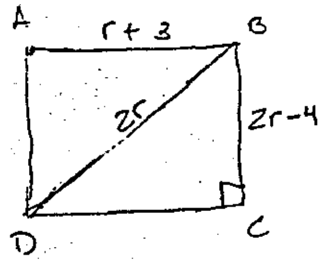
$= 140°$

$Z = 180° - 50° = 130°$

$X = 140°$

$\frac{(140)(140)(130)}{700} = 3640$

15\.



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

$r^2+6r+9+4r^2-16r+16 = 4r^2$

$r^2-10r+25=0$

$(r-5)^2=0$

$r=5$

$M = (5)^2\pi = 25\pi$

$N = (2r)^2 = (10)^2 = 100$

$O = AB \cdot BC$ (it is a rectangle) $= 8 \cdot 6 = 48$

$M+N-O = 25\pi + 100 - 48 = 25\pi + 52$

11\.

$A = \frac{16(\frac{1}{2})}{\tan(22.5°)} = \frac{8}{\tan(22.5°)}$

$B = \frac{1}{2}(18)\left(\frac{3\sqrt{3}}{2}\right) = \frac{27\sqrt{3}}{2}$

$C = \left(\frac{3}{2}\right)\left(\frac{3\sqrt{3}}{2}\right) = \frac{9\sqrt{3}}{4}$

$D = (4\sqrt{2})(2) = 8\sqrt{2}$

$\frac{AB\tan(22.5°)}{CD} = \frac{\left(\frac{8}{\cancel{\tan(22.5°)}}\right)\left(\frac{27\sqrt{3}}{2}\right)\left(\cancel{\tan 22.5°}\right)}{\left(\frac{9\sqrt{3}}{4}\right)(8\sqrt{2})}$

$= 3\sqrt{2}$

14\.

$\cancel{2\pi}(x+7) = 2(\cancel{2\pi})(x+1)$

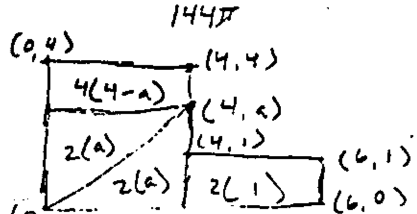
$x+7 = 2x+2$

$5 = x$

$\frac{\theta}{360°}\pi(12)^2 = \frac{1}{2}(6)^2\pi$

$\theta = \frac{18\pi}{144\pi} \cdot 360° = 45°$

6\.

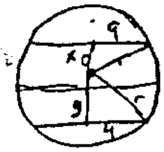


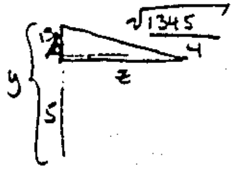
$2 = 16 - 4a \quad a = 7/2$

pts $(0,0)$ $(4, 7/2)$ $m = 7/8$

$8y = 7x$ or $7x - 8y = 0$

(8)





$r^2 = 9^2 + x^2$

$r^2 = 4^2 + y^2$

$x + y = 10$

$81 + x^2 = 16 + y^2$

$y^2 = x^2 + 65$

$(10 - x)^2 = x^2 + 65$

$100 - 20x + x^2 = x^2 + 65$

$20x = 35$

$x = 7/4$

$y = 33/4$

$r = \frac{\sqrt{1345}}{4}$

$z = \sqrt{\frac{1345}{16} - \left(\frac{13}{4}\right)^2}$

$z = \sqrt{\frac{1176}{16}} = \sqrt{\frac{147}{2}}$

$= \frac{\sqrt{294}}{2}$

length is $2z = \sqrt{294}$

$= 7\sqrt{6}$

(9) $2\pi r = 18\pi$

$r = 9$ in

$h = \frac{3}{5}\ell = 36$ in

$\ell = 60$ in

Area circle $= 81\pi$

Area rhombus $= 67$

$(4)(14)(24)\left(\frac{1}{2}\right)$

Area rectangle $= 2$

$(60)(36)$

Blue area $= (81\pi\ in^2)$

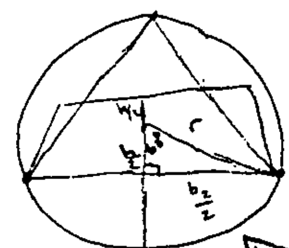
yellow area $= (672 - 81\pi)\ in^2$

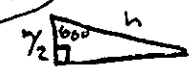
green area $= (1488 + 81\pi)\ in^2$

$\frac{1\ ft^2}{144\ in^2}\Big[2(1488 + 81\pi) + (672 - 81\pi) + \frac{7}{9}($

$= \frac{76}{3} + \pi$

(5) $\triangle AED$ is an equilateral triangle





$\frac{s^2\sqrt{3}}{4} = 16\sqrt{3}$

$s = 8 = b_2$

Area of ABCD $= h\left(\frac{b_1 + b_2}{2}\right) = 24$

Area of circle $= \pi r^2$

$r = \sqrt{\frac{h^2}{4} + \frac{b_2^2}{4}}$

$\frac{h\sqrt{3}}{2} = \frac{b_2}{2}$ $\quad h = \frac{b}{}$

$= \pi\left(\frac{h^2 + (b_2)^2}{4}\right)$

$= \pi\left(\frac{\frac{(b_2)^2}{3} + (b_2)^2}{4}\right) = \frac{\pi(b_2)^2}{3} = \frac{\pi(8^2)}{3} = \frac{64\pi}{3}$

(3) $2(2y + 6) = (2x - 2)(10)$

$2(4 + 2z) = 6(2y + 2)$

$6(4 + 2x - 2) = 2z(6)$

$4y + 12 = 20x - 20$

$8 + 4z = 12y + 12$

$12 + 12x = 12z$

or

$20x - 4y = 32$

$12y - 4z = -4$

$12x - 12z = -12$

$x = 12/7$

$y = 4/7$

$z = 19/7$

$x + y + z = \frac{4 + 12 + 19}{7} = 5$

(10) $A = \frac{(12)(9)}{2} = 54$

$B = \frac{(180)(10)}{12} = 150$

$C = 360$

$D = 160 = \frac{180(n-2)}{n}$

$n = 18$

$\frac{54 + 150}{360 + 18} = \frac{204}{378} = \frac{34}{63}$

(2) $\frac{289\pi}{4} = \pi r^2$

$r = \frac{17}{2}$ $\quad D = 17$

by Ptolemy's theorem:

$\overline{AB} \cdot 12 + 15 \cdot \overline{AD} = 17 \cdot \overline{BD}$

$8 \cdot 12 + 15 \cdot \sqrt{145} = 17 \cdot BD$

$BD = \frac{96 + 15\sqrt{145}}{17}$

(14) $4\pi r^2 = 84\pi$

$r^2 = 21$

$r = \sqrt{21}$

$0 = \frac{4}{3}\pi(21)\sqrt{21} - 0.004\sqrt{21}\,x$

$0.004\sqrt{21}\,x = 28\sqrt{21}\,\pi$

$x = \frac{28\pi}{0.004} = 7000\pi$ or $21,991$

(12)

$4 - 3 < x < 4 + 3$

$1 < x < 7$

$x = 2, 3, 4, 5, 6$

$2 + 3 + 4 + 5 + 6 = 20$

Geom Team