

PLANT CITY HIGH SCHOOL INVITATIONAL  
 GEOMETRY TEAM ROUND

MARCH 13, 1999  
 QUESTION 1

Points  $P(-4,8)$ ,  $Q(-2,-6)$ , and  $R(6,1)$  are the vertices of a triangle. Find the area of triangle  $PQR$ .

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 QUESTION 2

The formula  $d = \left| \frac{Ax_1 + By_1 + C}{\sqrt{A^2 + B^2}} \right|$  is used to find the distance from

any point  $(x_1, y_1)$  to the line  $Ax + By + C = 0$ . Use the formula to find the distance from the point  $(-3, -2)$  to the

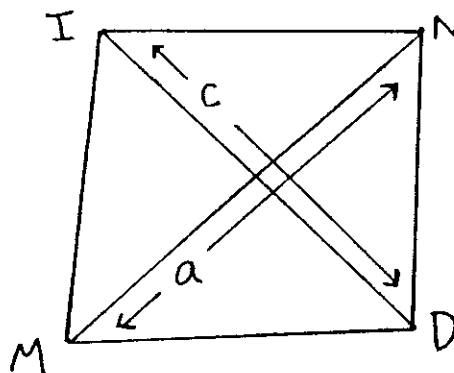
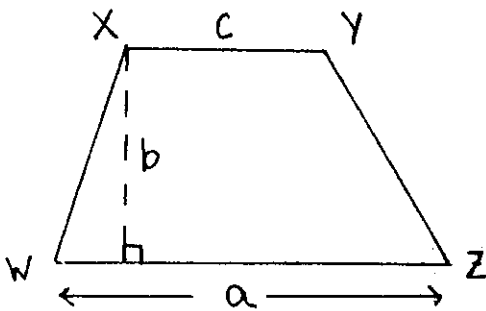
line  $y = \frac{4x + 2}{3}$ .

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 QUESTION 3

- $a$  = The number of diagonals in a dodecagon.
- $b$  = The degree of an exterior angle on a regular hexagon.
- $c$  = The hypotenuse of a right triangle with legs 8 and 15.

Find the area of trapezoid  $WXYZ$ , and subtract the area of rhombus  $MIND$ .



$ID = c$   
 $MN = a$

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 QUESTION 4

A sphere has a volume of  $288\pi$ . Find the surface area.

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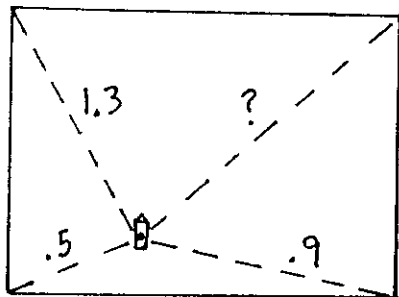
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QUESTION 5

What quotient results in dividing the golden ratio by  $\frac{4}{2 - 2\sqrt{5}}$  ?

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QUESTION 6

Farmer Bob has to repair the four corner posts in a rectangular pasture (of which dimensions are relatively unimportant). At noon he is working on the north east corner post when he suddenly has to "go". Knowing that the north west corner post is 1.3 miles from the outhouse, the south west corner post is .5 miles from the outhouse, and the south east corner post is .9 miles from the outhouse, he quickly figures out that he has a way to go. How far does he have to run to get to the outhouse?



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QUESTION 7

A regular icosahedron has 30 edges. How many vertices does it have?

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QUESTION 8

What fraction of the distance between the two points A(6,4) and B(1,-1) is the point (3,1)? Assume that you start at point A.

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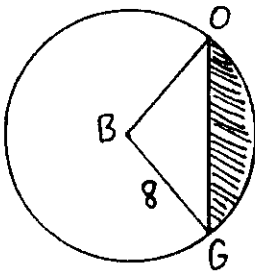
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 QUESTION 9

ABCDEFGHIJKLMNPOQRSTUVWXYZ is 26-gon with  $AB = 1$ ,  $BC = 3$ ,  $CD = 5$ ,  
 $DC = 7$ , . . .  $ZA = 51$ . Find the perimeter.

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 QUESTION 10

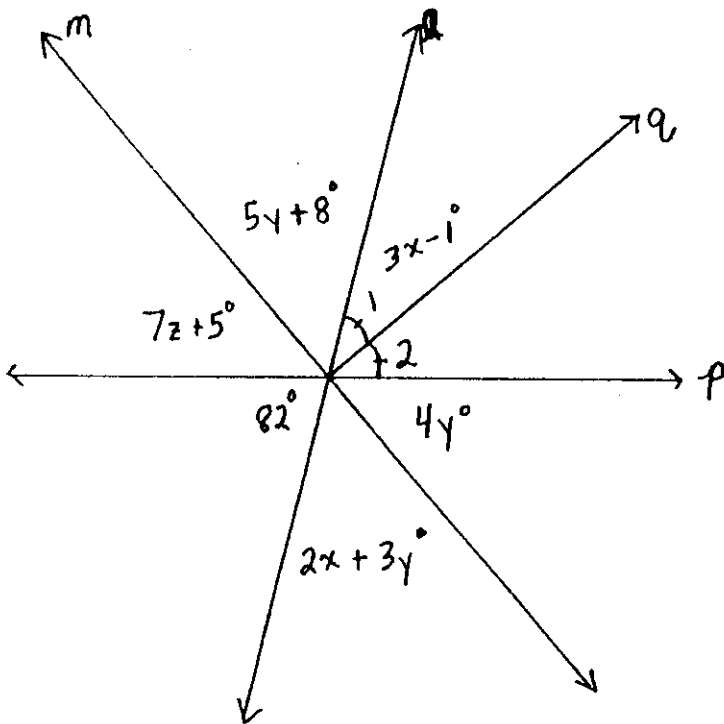
Given: Circle B,  $BG = 8$ ,  $m\angle OBG = 120^\circ$ , find area of the shaded region.



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 QUESTION 11

Given lines  $l$ ,  $m$ , and  $p$  and ray  $q$ .  $\angle 1 \cong \angle 2$ . Find  $\frac{xy}{z}$ .



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 QUESTION 12

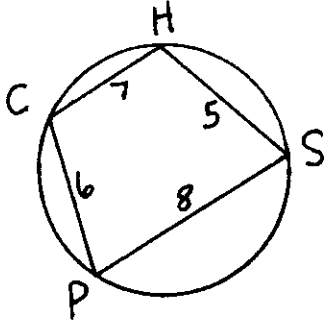
Find the area between the inscribed and circumscribed circles of  
 a regular hexagon with a side of 6

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 QUESTION 13

Given circle O, find the area of the inscribed quadrilateral

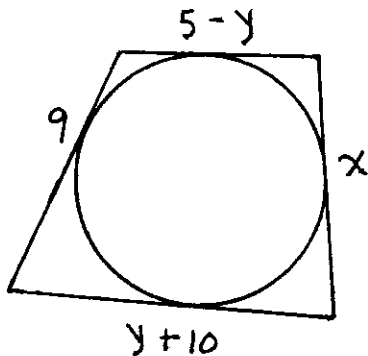
PCHS.  $PC = 6$ ,  $CH = 7$ ,  $HS = 5$ ,  $PS = 8$ .



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 QUESTION 14

Given the circumscribed quadrilateral as marked, find the value of  $x$ .



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 QUESTION 15

Given Circle R with radius 3, Circle V with radius 10, and common internal tangent  $SU = 26$ , find the length of segment  $ST$  when point  $T$  is the point of intersection of segments  $RV$  and  $SU$ .

