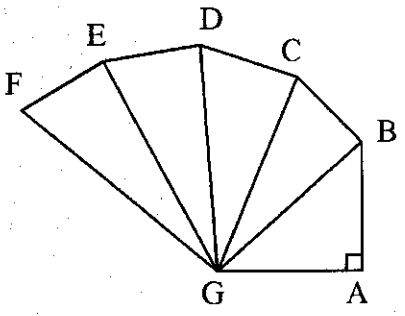
Geometry Team Question #1 **Vero Beach Invitational 3/19/05**

1. What is the length of segment $\overline{FG}$ in the polygon shown?
   $AB = AG = BC = CD = DE = EF = 2$, and
   $\angle A, \angle GBC, \angle GCD, \angle GDE, \angle GEF$ are right angles..



Geometry Team Question #2 **Vero Beach Invitational 3/19/05**

X= the perimeter of an isosceles triangle with base 10 and area 60

Y= the exact length of $\overline{BC}$ in triangle ABC where $m\angle B = 90, AC = 7, AB = 5$

W = the area of a triangle with vertices (0,0), (6,0), (0,4)

Z= the length of the median to the hypotenuse in a right triangle with legs having measures of 10 and 24.

Find the value of $Y\left(Z - \frac{X}{W}\right)$.

Geometry Team Question #3 **Vero Beach Invitational 3/19/05**

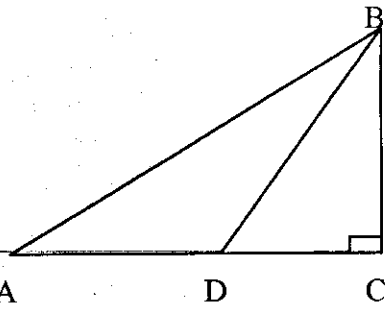
A= the area of a rectangle with length 6 more than twice the width and having a perimeter of 66

B= the length of a rectangle having the same area as a square with sides of length 16 when the width of the rectangle is $\frac{1}{4}$ of the length of the rectangle

If A and B are legs of a right triangle find the length of the hypotenuse rounded to the nearest tenth.

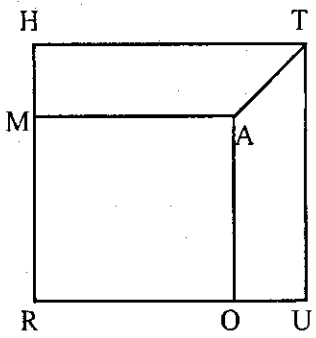
Geometry Team Question #4 **Vero Beach Invitational 3/19/05**

In ΔADB, $m\angle C = 90, m\angle A = 30, m\angle BDC = 60, BC = 5$.
If the exact perimeter of ΔADB is $R + S\sqrt{3}$, give the value of $R + S$.



Geometry Team Question #5 **Vero Beach Invitational 3/19/05**

Square RUTH has side length $\sqrt{10}$.
Square ROAM has side length $\sqrt{5}$.
Find the exact area of trapezoid MATH in simplest form.



Geometry Team Question #6 **Vero Beach Invitational 3/19/05**

Carey drew a circle with center C and diameter 5 cm long. From an external point, both a tangent segment and a secant segment are drawn to the circle, the secant containing the diameter of the circle. If the length of the tangent segment is 3.5 cm more than the length of the radius of the circle, how far (in cm) from C is the external point?

Geometry Team Question #7 **Vero Beach Invitational 3/19/05**

X = the length of $\overline{RQ}$ in ΔPQR when $\overline{RS}$ is the altitude to hypotenuse $\overline{PQ}$, $PS = 27, SQ = 3$

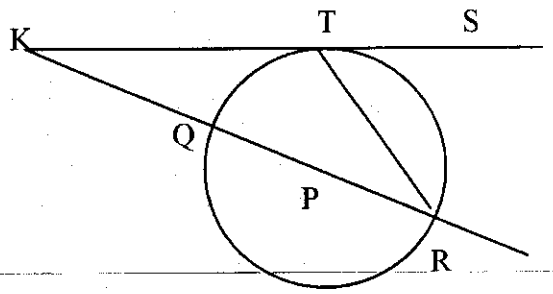
Y = the area of ΔABC when D is a point of $\overline{AC}$ such that AD = 2CD, E is on $\overline{BC}$ such that $\overline{DE} \parallel \overline{AB}$, and the area of ABED = 40

Z = the perimeter the smaller triangle of two similar triangles when the perimeter of the larger is 44 and the ratio of the areas is $\frac{81}{121}$

Find the exact value of $\frac{X^2}{Y} + Z$.

Geometry Team Question #8 **Vero Beach Invitational 3/19/05**

Given that $\overleftrightarrow{KS}$ is tangent to the circle at T and secant $\overleftrightarrow{KR}$ contains P, the center of the circle. If $m\angle K = 35$, find the sum of the measures of minor arc $\overset{\frown}{QT}$ and $m\angle STR$.



Geometry Team Question #9 **Vero Beach Invitational 3/19/05**

A= the length of the other diagonal for rhombus ABCD when AC=6 and AD =5

B= the exact area of a rhombus with one diagonal 12 and a side having length $3\sqrt{13}$

C= the exact area of a square with a diagonal of $6\sqrt{3}$

D= the exact ratio of the area of a square with side length 5 to the area of a rectangle with a length of 5 and a diagonal of 10.

Find the exact value of $\frac{B}{C} + A + D\sqrt{3}$.

Geometry Team Question #10 **Vero Beach Invitational 3/19/05**

X = the area of the smaller sector DAE in circle A given $m\angle DAE = 60$ and AE = 4. with points D and E on the circle,

Y = the area of a circle that has an inscribed rectangle with length 16 and perimeter 56

Z = the perimeter of ΔPQR formed when from an external point P, tangents $\overline{PQ}$ and $\overline{PR}$ are drawn to a circle where Q and R are points of tangency, $PQ = 2, m\angle P = 60$

Find the exact value of $\frac{3X + Y}{Z}$.

Geometry Team Question #11 **Vero Beach Invitational 3/19/05**

The bases of a hemisphere and a cone are congruent circles and are coplanar. A plane through the vertex of the cone is parallel to the plane of the bases and is tangent to the hemisphere. What is the ratio of the volume of the cone to the volume of the hemisphere?

Geometry Team Question #12 **Vero Beach Invitational 3/19/05**

A= the exact length of an arc of a circle with a radius of 4 and the central angle of the arc is 45 degrees

B= the area of a circle inscribed in a square with a diagonal of $5\sqrt{2}$

C= the circumference of a circle when its radius is ½ the length of the diagonal of a rectangle with an area of 240 and a length of 24

Find the exact value of $\frac{C-A}{B}$.

Geometry Team Question #13 **Vero Beach Invitational 3/19/05**

Given: the volume of a right regular square pyramid is 384 cu in. and its altitude is 8 in.

A = the length of an edge of the base

B = the lateral surface area of the pyramid

Find the value of $\frac{B}{A}$.

Geometry Team Question #14 **Vero Beach Invitational 3/19/05**

A spherical ball of radius 3 inches has a hollow center of radius 2 in. What is the volume of the shell? (The shell is the part enclosed by both spheres.)

Geometry Team Question #15 **Vero Beach Invitational 3/19/05**

Isosceles right triangle ABC with hypotenuse $\overline{AC}$ has an area of 20.
Find the length of segment $\overline{AC}$.