

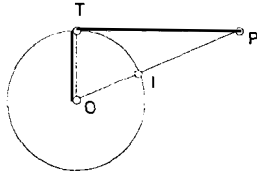
**Geometry Ciphering - Hoover High School
Math Tournament - February 24, 2001**

1-1. Find the area of a regular hexagon with side length of 6.

ANS:
 $54\sqrt{3}$

1-2. Given circle O, with radius of 4 units, and point P, 8 units from point I, find the length of the tangent from P to circle O.

$8\sqrt{2}$



1-3. Find the surface area of a square pyramid with lateral edge 5 and base edge of 6.

84

1-4. Find the area of a circle with circumference of 7.

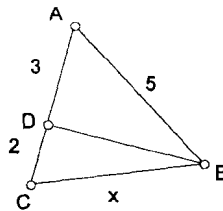
$49/(4\pi)$

1-5. What is the distance from the midpoint M of the segment joining the points A (3,4) and B (7, 1) to point A?

$5/2$

2-1. Given $BD \perp AC$. Find BC.

$2\sqrt{5}$



2-2. Determine the area bounded by the lines connecting the points A (1,2), B (3, 6) and C (5, 4).

6

2-3. Chord AB is 7 units from the center of the circle and is 48 units long. Find the circumference of the circle.

50π

2-4. There are 2001 distinct points in the plane, no three of which are collinear, how many total lines can be drawn connecting each point to the other points?

2,001,000

2-5. A rhombus has diagonal of 12, and the other diagonal is the same length as the sides. What is the area of the rhombus?

$24\sqrt{3}$

3-1. The measure of the supplement of an angle is 60 less than three times the measure of the complement of the angle. Find the measure of the angle.

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3-2. Find an equation of the line perpendicular to $x - 6y = 4$ through the point $(3, -2)$. $6x + y = 16$
 $y = -6x + 16$

3-3. Quadrilateral ABCD is inscribed in a circle. $m\angle A = 7x + 20$, $m\angle B = 10x + 5$ and $m\angle C = 3x + 40$, find $m\angle D$. 55

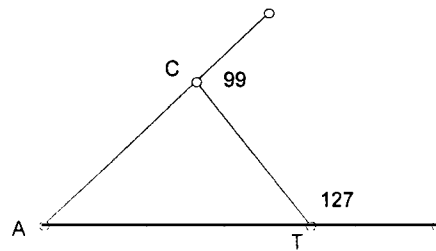
3-4. What is the length of the radius of a circle if the ratio of the area to the circumference is 5:1? 10

3-5. The space diagonal of a cube is 5. Find its surface area. 50

4-1. What is the measure of each interior angle of a convex polygon with 9 diagonals? 120

4-2. Two chords intersect each other at a right angle. If one chord is divided into segments of 1 and 6, and the other chord is divided into segments of 2 and 3, what is the area of the circle? $(25\pi)/2$

4-3. Find $\angle CAT$.



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4-4. Find the area of the incircle of a triangle whose area is 6 and perimeter is 12. π

4-5. Given the edge of a regular tetrahedron is 6, find the surface area of the inscribed sphere. π

E-1. A sphere has a radius of 3 feet. Find the ratio of the surface area of the sphere to the volume of the sphere. 1:1 or 1

E-2. A right triangle has sides x , $x + 7$, and $x + 8$. Find the area of the triangle. 30

E-3. Consider a great rhombicosidodecahedron. If f represents the number of faces of the polyhedron, v represents the number of vertices, and e represents the number of edges, find $f + v - e$. 2