

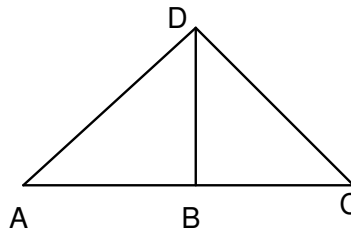
1. Find the number of sides of a regular polygon when one exterior angle has a measure of 40° .
2. Find the degree measure of the largest angle of a quadrilateral whose angle measures are in the ratio of 1:2:3:4.
3. Find the length of the median of a trapezoid that has an area of 50 square units and altitude of 10 units.
4. Find the diameter of a circle whose area in square units equals the circumference in units.

Geometry Team Question #2

Middleton Invitational February 24, 2007

In the diagram, $\triangle ADC$ is a right triangle with $\overline{DB} \perp \overline{AC}$ and $\overline{AD} \perp \overline{CD}$, $CD = 5$ and $BC = 4$.

1. Find the length of \overline{AD} .
2. Find the length of \overline{AB} .
3. Find the length of \overline{BD} .
4. Find the length of \overline{AC} .



Geometry Team Question #3

Middleton Invitational February 24, 2007

1. Find the circumference of a circle with endpoints of a diameter at coordinates $(-2, 3)$ and $(3, -9)$.
2. Find the area of the smaller of two similar triangles with corresponding perimeters of 2 and 6 and the area of the larger triangle is 81.
3. Find the area of a rhombus that has one diagonal twice the other and a perimeter of $20\sqrt{5}$.
4. Find the number of sides in a convex polygon with 170 diagonals.

Geometry Team Question #4

Middleton Invitational February 24, 2007

1. In math class, students were asked to draw a polygon and its diagonals. Ralph drew a triangle, Buddy drew a quadrilateral, Harry drew a pentagon, Curt drew an octagon, and Alan drew a polygon. Curt's polygon had the number of diagonals that was 12 more than one-half the sum of all the other diagonals. Find the number of sides Alan's polygon has.
2. Point P is 13 inches from the center of the circle with radius 5 inches. Find the length in inches of the tangent segment to the circle from point P.
3. A rectangle having a side of length 15 is inscribed in a circle of diameter 17. Find the area of the rectangle.
4. The minute hand of a clock is 6 inches long. Find the number of inches the tip of the hand travels during the time from 10:00 am to 2:45 pm?

Geometry Team Question #5

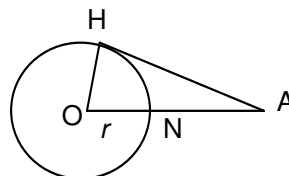
Middleton Invitational February 24, 2007

1. Find the area of a triangle with sides of 9, 16, and 21.
2. Find the area of a triangle with vertices $(3, -4), (-2, 5), (-1, 6)$.
3. Find the area of $\triangle ABC$ with $AC = 2\sqrt{2}, m\angle B = 45, m\angle A = 30$.
4. Find the sum of the lengths of the diagonals in a rhombus with a sides of 10 and one angle having measure of 60 degrees.

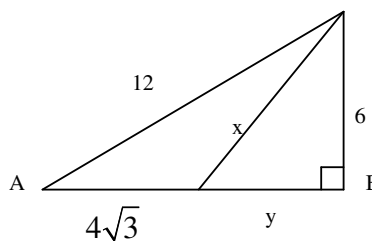
Geometry Team Question #6

Middleton Invitational February 24, 2007

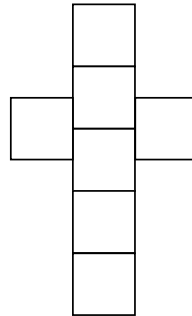
1. A quadrilateral is inscribed in a circle. Two angles measure 50 and 103. Find the measures of the other two angles.
2. A nonagon has 5 congruent angles and 4 other angles which measure 30, 140, 120, and 130. Find the measure of the exterior angle of the largest angle.
3. In the figure, O is the center of the circle, \overline{AH} is tangent to the circle at H, $ON = NA$ and the radius of the circle is r . Find, in terms of r , the exact area of the region inside $\triangle AOH$ and outside the circle. Express your answer as a single fraction.



4. Determine the value of x in the diagram.



1. Find the area between a square and its circumscribed circle when the side of the square is 8.
2. Find the number of sides of a regular polygon with the ratio of the interior angle to exterior angle is 2:1.
3. Find the perimeter of the diagram shown formed by seven congruent squares where the area of the diagram is 343.

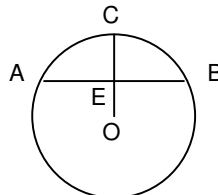


4. Find the perimeter of an equilateral triangle whose area is $16\sqrt{3}$.

Geometry Team Question #8

Middleton Invitational February 24, 2007

1. Find the length of $A'B'$ when $\Delta ABC \sim \Delta A'B'C'$, $AC = 8$, $AB = 7$, $A'C' = 3$.
2. In the figure below of $\odot O$, the radius \overline{OC} has a measure of one. Find the area of ΔABC in terms of x , where x is the length of \overline{OE} .



3. Find the difference in the measures of the acute angles of a right triangle when the square of the hypotenuse is equal to twice the product of the legs
4. Find the longer leg in a 30-60-90 triangle when the median to the hypotenuse has a length of 5.

Geometry Team Question #9

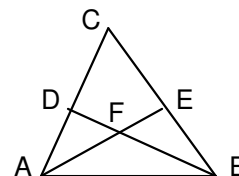
Middleton Invitational February 24, 2007

1. Equilateral $\triangle ABC$ is revolved about side \overline{BC} as an axis of rotation. Find the exact distance traveled by point A in one revolution if $BC = 6$.
2. $\triangle ABC$ is isosceles with base \overline{AC} , $AB = 10\text{cm}$, and $m\angle ABC = 120^\circ$. Find the length of \overline{AC} in cm.
3. Find the length of the radius of a circle in which a 48 cm chord is 8 cm closer to the center than a 40 cm chord.
4. The measure of the supplement of an angle exceeds three times the measure of the complement by 10. Find the complement of the angle in degrees.

Geometry Team Question #10

Middleton Invitational February 24, 2007

1. Find the slope of the line that passes through the points $(\sqrt{2}, \sqrt{3})$ and $(\sqrt{18}, 2\sqrt{12})$.
2. Find the perimeter of a triangle formed by connecting the midpoints of the sides of a triangle with sides having lengths 6, 6, and 8.
3. Find the $m\angle AFB$ in $\triangle ABC$ where altitudes \overline{AE} and \overline{BD} are drawn and F is the point of intersection of the altitudes (see diagram). $m\angle CAB = 80^\circ$, $m\angle CBA = 60^\circ$



4. Find the length of a leg of an isosceles trapezoid where the bases are 33 and 43 and the distance between the bases is 12.

Geometry Team Question #11

Middleton Invitational February 24, 2007

1. In $\triangle FGH$, \overline{GJ} (with J on \overline{FH}) bisects $\angle FGH$, $FG = 10$, $GH = 8$, $FH = 12.6$. Find the length of \overline{FJ} .
2. Find the length of the smallest side of a right triangle when the perimeter is 30 and the sum of the squares of the 3 sides is 338.
3. The diameter of the front wheel of a tricycle is 10 inches and the diameter of each of the back wheels is 5 inches. How many revolutions has one of the back wheels made when the front wheel has turned 1080° ?
4. Find the distance between the midpoints of \overline{AB} and \overline{CD} where the endpoints of \overline{AB} are $(-12, 7)$ and $(2, 5)$ and the endpoints of \overline{CD} are $(-4, -20)$ and $(10, -4)$.

Geometry Team Question #12**Middleton Invitational February 24, 2007**

1. Find the volume of a right circular cone when the diameter of the base is 18 and the slant height is 15.
2. Find the ratio of the diagonal of a square to the diameter of a circle when the figures both have areas of 24.
3. Find the number of sides of a regular polygon with one interior angle having a measure of 156° .
4. The sides of a triangle are 4, 5, and 6. Each side is trisected and the points of division are joined to form a hexagon. Find the perimeter of the hexagon.

Geometry Team Question #13**Middleton Invitational February 24, 2007**

1. If a 12 inch chord of a circle is bisected by a 15 inch chord, find the number of inches in the shorter segment of the 15 inch chord.
2. How many posts 12 feet apart in a straight line are needed to hold a wire fence 180 feet long? Each endpoint of the fence has a post.
3. The length of a side of the smaller of two similar triangles is 300 cm while the corresponding side of the larger is 6 m. Find the ratio of the areas of the larger to the smaller.
4. Find the length, in cm, of a side of a square when the diagonal is 10 cm longer than a side.

Geometry Team Question #14**Middleton Invitational February 24, 2007**

1. Find the length of the diagonal of a rectangular solid with dimensions, 4, 5, 8.
2. Find the area of a triangle with sides having lengths 4, 13, and 15.
3. Find the sum of the measure of the six exterior angles of a triangle.
4. Find the radius of the circle $x^2 + y^2 - 4x + 8y - 5 = 0$.