

2022 Grissom Math Tournament

Geometry : 3 – 4 – 5 Team Contest

Sample Round

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1. Evaluate: $2(16 - 9)^2 - 111/3$	2. How many multiples of 5 are there between 144 and 961?
3. Given a cube with edge = 11 inches, let A = the number of cubic inches in the volume of the cube and B = the number of square inches in the surface area of the same cube, what is the value of A – B?	4. Solve for x: $\frac{x+3}{4} - \frac{x+1}{5} = 2$
5. How many distinct arrangements are there of the letters in the word: ALGEBRA ?	

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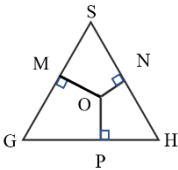
Round 1

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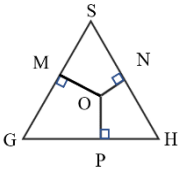
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Round 1

Round 1:

1. What is the sum of the measures of the interior angles of a regular hexadecagon? (16-sided polygon).	2. Simplify: $\sqrt{320} - \sqrt{80} + \frac{65}{\sqrt{125}}$
3. In equilateral triangle GHS, GS is 10. Find ON if $OP=OM=2\sqrt{3}$. 	4. What is the sum of the x- and y- coordinates of the point that is $\frac{4}{5}$ of the way from (2,8) to (-8,11)?
5. Find the total surface area of a square pyramid with height 24 and slant height 25.	

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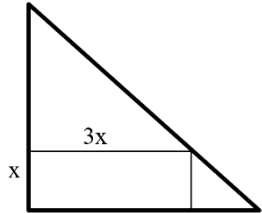
Round 2

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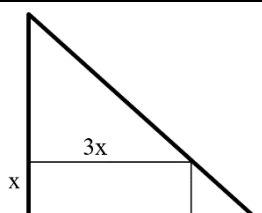
Geometry : 3 – 4 – 5 Team Contest

Round 2

Round 2

1. Find the number of diagonals in a hexadecagon.	2. What is the degree measure of the acute angle formed by the minute and hour hands of a clock at 4:30?
3. The points $(3, -3)$, $(6, 2)$, and $(-7, 3)$ are vertices of a right triangle. If the coordinates of the midpoint of the hypotenuse of the triangle are (h, k) , find the value of $k - h$.	4. Find the area of the region between the two concentric circles if the length of the chord of the larger circle, tangent to the inside circle is 12. 
5. A rectangle, with length equal three times its width, is inscribed in a right triangle as shown. Find the ratio of the area of the rectangle to the area of the triangle.	

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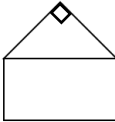
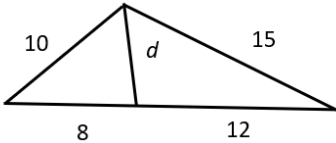
Round 3

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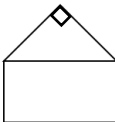
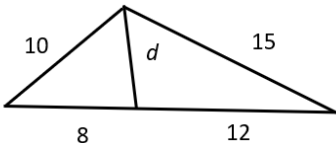
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Round 3

Round 3

1. The diagonals of a parallelogram are 5 and 8, and one side of the parallelogram has length 7, what is the area of the parallelogram?	2. Find the surface area of a sphere whose diameter is equal to the apothem of a regular hexagon with each side of length 12.
3. A quadrilateral is inscribed in a circle. If two of the angles measure 79° and 134° , what is the difference between the other two angles?	4. The pentagon shown is constructed out of a rectangle and an isosceles right triangle that share one side. What is the perimeter of the pentagon? 
5. Find the length d shown in the picture, given the other side lengths. 	

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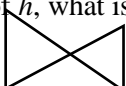
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Round 4

Round 4

<p>1. Two vertical bamboo poles with heights 4.5 feet and 6 feet in the garden each have a string tied from their top to the base of the other pole. If the strings intersect at a height of h, what is the value of h?</p> 	<p>2. The angles in a convex pentagon form an arithmetic sequence with common difference 4. Find the measure of the smallest angle.</p>
<p>3. Find the area of triangle ABC given A(5, -2) and B and C are the points where $y = 2x - 3$ intersects the circle $x^2 + y^2 = 36$.</p>	<p>4. In regular octagon MATHNERD, line segment \overline{RD} has length 8. Find the length of \overline{AN}.</p>
<p>5. Two spheres are inscribed in a cylinder with diameter 3 inches and height 6 inches. What is the volume inside the cylinder but outside the spheres?</p>	

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