MU ALPHA THETA
NATIONAL CONVENTION
SAN DIEGO 2013

Hustle
Test #841
Geometry

MU ALPHA THETA
NATIONAL CONVENTION
SAN DIEGO 2013

Hustle
Test #841
Geometry

MU ALPHA THETA
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Hustle
Test #841
Geometry

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Hustle
Test #841
Geometry

#1 Geometry – Hustle
MAΘ National Convention 2013

In a certain polyhedron, twice the number of edges is three times the number of vertices, and twice the number of faces is one less than the number of edges. Find the number of faces in this polyhedron.

Answer : ______________________

Round 1 2 3 4 5

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Round 1 2 3 4 5

#2 Geometry – Hustle
MAΘ National Convention 2013

If $m\angle A = 16°18'24"$ and $m\angle B = 3m\angle A$, find $m\angle B$. Express your answer in D°M'S'' notation.

Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5

#3 Geometry – Hustle
MAΘ National Convention 2013

Represent as a single fraction the degree measure of the complement of an angle whose measure is $\left(\frac{2}{3}x-10\right)°$.

Answer : _____

Round 1 2 3 4 5

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MAΘ National Convention 2013

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Round 1 2 3 4 5

#4 Geometry – Hustle
MAΘ National Convention 2013

Complete the blank: Let P be a point interior to an angle ABC. If P is equidistant from both rays AB and BC, then P must lie on the _____ of the angle.

Answer : _____

Round 1 2 3 4 5

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MAΘ National Convention 2013

Complete the blank: Let P be a point interior to an angle ABC. If P is equidistant from both rays AB and BC, then P must lie on the _____ of the angle.

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Round 1 2 3 4 5

#5 Geometry – Hustle
MAΘ National Convention 2013

Points *J*, *K*, and *L* lie in some order on a line. If $JK < KL$, which point cannot possibly lie between the other two?

Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5

#6 Geometry – Hustle
MAΘ National Convention 2013

The measures of the three angles of a triangle are in the ratio 4:4:12. Find the supplement of the largest angle, in degrees.

Answer : ______________________

Round 1 2 3 4 5

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Round 1 2 3 4 5

#7 Geometry – Hustle
MAΘ National Convention 2013

Find the centroid of the triangle whose vertices are (4, 8), (0, 0), and (6, 2).

Answer : ______________________

Round 1 2 3 4 5

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Round 1 2 3 4 5

#8 Geometry – Hustle
MAΘ National Convention 2013

A certain convex polygon has exactly five diagonals. How many sides does that polygon have?

Answer : ________________________

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Answer : ________________________

Round 1 2 3 4 5

#9 Geometry – Hustle
MAΘ National Convention 2013

Write the slope-intercept form of the line perpendicular to $4x-3y=12$ that passes through (4, 6).

Answer : _____

Round 1 2 3 4 5

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#10 Geometry – Hustle
MAΘ National Convention 2013

The perimeter of a triangle is 30 inches. The bisector of one angle divides the opposite side into segments 4 inches and 6 inches long. Find the length, in inches, of the shortest side.

Answer : ______________________

Round 1 2 3 4 5

#10 Geometry – Hustle
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The perimeter of a triangle is 30 inches. The bisector of one angle divides the opposite side into segments 4 inches and 6 inches long. Find the length, in inches, of the shortest side.

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Round 1 2 3 4 5

#11 Geometry – Hustle
MAΘ National Convention 2013

In triangle *SAN*, $m\angle A = 135°, SA = 10,$ and $AN = 12\sqrt{2}$. Find *SN*.

Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5

#12 Geometry – Hustle
MAΘ National Convention 2013

A rectangle 6 inches wide has a diagonal 10 inches long. Find its semiperimeter (in inches).

Answer : ______________________

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A rectangle 6 inches wide has a diagonal 10 inches long. Find its semiperimeter (in inches).

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Round 1 2 3 4 5

#13 Geometry – Hustle
MAΘ National Convention 2013

Find the area of an equilateral triangle whose height is $6\sqrt{2}$ units.

Answer : ______________________

Round 1 2 3 4 5

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Answer : ______________________

Round 1 2 3 4 5

#14 Geometry – Hustle
MAΘ National Convention 2013

The sides of a triangle are 10, 17, and 21 units. Find the length of the altitude to the 21-inch side, measured in inches.

Answer : ____________________

Round 1 2 3 4 5

#14 Geometry – Hustle
MAΘ National Convention 2013

The sides of a triangle are 10, 17, and 21 units. Find the length of the altitude to the 21-inch side, measured in inches.

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Round 1 2 3 4 5

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Round 1 2 3 4 5

#15 Geometry – Hustle
MAΘ National Convention 2013

Rectangle *MATH* has interior point *X*.
If $MX = 3$, $XT = 8$, and $XH = 6$, find *AX*.

Answer : ______________________

Round 1 2 3 4 5

#15 Geometry – Hustle
MAΘ National Convention 2013

Rectangle *MATH* has interior point *X*.
If $MX = 3$, $XT = 8$, and $XH = 6$, find *AX*.

Answer : ______________________

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Round 1 2 3 4 5

#16 Geometry – Hustle
MAΘ National Convention 2013

If one angle of a rhombus has a measure of $60°$, the diagonals have lengths in the ratio *a*:*b*, where *a* and *b* are positive relatively prime integers. Find the product *ab*.

Answer : ______________________

Round 1 2 3 4 5

#16 Geometry – Hustle
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Answer : ______________________

Round 1 2 3 4 5

#17 Geometry – Hustle
MAΘ National Convention 2013

Find the length, in inches, of a lateral edge of a regular square pyramid with a 4-inch altitude and a 6-inch base.

Answer : ______________________

Round 1 2 3 4 5

#17 Geometry – Hustle
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Find the length, in inches, of a lateral edge of a regular square pyramid with a 4-inch altitude and a 6-inch base.

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Answer : ______________________

Round 1 2 3 4 5

#18 Geometry – Hustle
MAΘ National Convention 2013

Find the sum of the first five pentagonal numbers.

Answer : _____

Round 1 2 3 4 5

#18 Geometry – Hustle
MAΘ National Convention 2013

Find the sum of the first five pentagonal numbers.

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Round 1 2 3 4 5

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Find the sum of the first five pentagonal numbers.

Answer : _____

Round 1 2 3 4 5

#19 Geometry – Hustle
MAΘ National Convention 2013

The diagonal of a face of a cube is 4 inches long. Find the length of the space diagonal, measured in inches.

Answer : ______________________

Round 1 2 3 4 5

#19 Geometry – Hustle
MAΘ National Convention 2013

The diagonal of a face of a cube is 4 inches long. Find the length of the space diagonal, measured in inches.

Answer : ______________________

Round 1 2 3 4 5

#19 Geometry – Hustle
MAΘ National Convention 2013

The diagonal of a face of a cube is 4 inches long. Find the length of the space diagonal, measured in inches.

Answer : ______________________

Round 1 2 3 4 5

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MAΘ National Convention 2013

The diagonal of a face of a cube is 4 inches long. Find the length of the space diagonal, measured in inches.

Answer : ______________________

Round 1 2 3 4 5

#20 Geometry – Hustle
MAΘ National Convention 2013

In right triangle *ABC* with right angle *C*, $\sin A \approx 0.788$ and $\tan B \approx 0.781$. List the following in order from smallest to greatest: $\cos B, \tan A, \cos A$.

Answer : _____

Round 1 2 3 4 5

#20 Geometry – Hustle
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In right triangle *ABC* with right angle *C*, $\sin A \approx 0.788$ and $\tan B \approx 0.781$. List the following in order from smallest to greatest: $\cos B, \tan A, \cos A$.

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Round 1 2 3 4 5

#21 Geometry – Hustle
MAΘ National Convention 2013

A supporting wire (guy wire) stretches from the ground to the top of a television transmitting tower 200 feet high. The angle the wire forms with its projection on the ground measures $75°$. Find the exact length of the wire, in feet. Your answer should not contain a double radical and should not contain a trigonometric function.

Answer : _____

Round 1 2 3 4 5

#21 Geometry – Hustle
MAΘ National Convention 2013

A supporting wire (guy wire) stretches from the ground to the top of a television transmitting tower 200 feet high. The angle the wire forms with its projection on the ground measures $75°$. Find the exact length of the wire, in feet. Your answer should not contain a double radical and should not contain a trigonometric function.

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Answer : _____

Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#22 Geometry – Hustle
MAΘ National Convention 2013

In right triangle *CAT* with right angle *C*, $\sin A = \frac{\sqrt{3}}{2}$. What is the measure of angle *T*, in radians?

Answer : _____

Round 1 2 3 4 5

#22 Geometry – Hustle
MAΘ National Convention 2013

In right triangle *CAT* with right angle *C*, $\sin A = \frac{\sqrt{3}}{2}$. What is the measure of angle *T*, in radians?

Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#23 Geometry – Hustle
MAΘ National Convention 2013

Find the area of the circle generated by
$x^2+4y+y^2-18x-7=0$.

Answer : _____

Round 1 2 3 4 5

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MAΘ National Convention 2013

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Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#24 Geometry – Hustle
MAΘ National Convention 2013

A tangent segment to a circle has length 4 and a secant segment from the same point to the same circle has length 8. Find the length of the chord created by the secant.

Answer : ______________________

Round 1 2 3 4 5

#24 Geometry – Hustle
MAΘ National Convention 2013

A tangent segment to a circle has length 4 and a secant segment from the same point to the same circle has length 8. Find the length of the chord created by the secant.

Answer : ______________________

Round 1 2 3 4 5

#24 Geometry – Hustle
MAΘ National Convention 2013

A tangent segment to a circle has length 4 and a secant segment from the same point to the same circle has length 8. Find the length of the chord created by the secant.

Answer : ______________________

Round 1 2 3 4 5

#24 Geometry – Hustle
MAΘ National Convention 2013

A tangent segment to a circle has length 4 and a secant segment from the same point to the same circle has length 8. Find the length of the chord created by the secant.

Answer : ______________________

Round 1 2 3 4 5

#25 Geometry – Hustle
MAΘ National Convention 2013

What is the degree measure of the larger angle formed by the hands of a clock at 4:03?

Answer : _____

Round 1 2 3 4 5

#25 Geometry – Hustle
MAΘ National Convention 2013

What is the degree measure of the larger angle formed by the hands of a clock at 4:03?

Answer : _____

Round 1 2 3 4 5

#25 Geometry – Hustle
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Answer : _____

Round 1 2 3 4 5

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Round 1 2 3 4 5