#1 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the solutions to the equation $2x^2 - 76x + 1 = 0$.

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the solutions to the equation $2x^2 - 76x + 1 = 0$.

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the solutions to the equation $2x^2 - 76x + 1 = 0$.

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the solutions to the equation $2x^2 - 76x + 1 = 0$.

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2019

Find the equation for the horizontal asymptote of the graph of the function $y = \frac{2x^2 - 76x + 1}{-3x^2 + x + 12}$.

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2019

Find the equation for the horizontal asymptote of the graph of the function $y = \frac{2x^2 - 76x + 1}{-3x^2 + x + 12}$.

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2019

Find the equation for the horizontal asymptote of the graph of the function $y = \frac{2x^2 - 76x + 1}{-3x^2 + x + 12}$.

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2019

Find the equation for the horizontal asymptote of the graph of the function $y = \frac{2x^2 - 76x + 1}{-3x^2 + x + 12}$.

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2019

When three standard, fair, six-sided dice are rolled, what is the probability that the sum of the rolled faces is 16 or higher?

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2019

When three standard, fair, six-sided dice are rolled, what is the probability that the sum of the rolled faces is 16 or higher?

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2019

When three standard, fair, six-sided dice are rolled, what is the probability that the sum of the rolled faces is 16 or higher?

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2019

When three standard, fair, six-sided dice are rolled, what is the probability that the sum of the rolled faces is 16 or higher?

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2019

Find the interest accumulated, rounded down to the nearest penny, when $1000 is deposited for one year in an account earning 4% annual interest compounded twice per year.

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2019

Find the interest accumulated, rounded down to the nearest penny, when $1000 is deposited for one year in an account earning 4% annual interest compounded twice per year.

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2019

Find the interest accumulated, rounded down to the nearest penny, when $1000 is deposited for one year in an account earning 4% annual interest compounded twice per year.

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2019

Find the interest accumulated, rounded down to the nearest penny, when $1000 is deposited for one year in an account earning 4% annual interest compounded twice per year.

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2019

Evaluate the determinant: $\begin{vmatrix} -1 & 2 & -3 \\ 4 & 5 & 6 \\ -7 & 8 & -9 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2019

Evaluate the determinant: $\begin{vmatrix} -1 & 2 & -3 \\ 4 & 5 & 6 \\ -7 & 8 & -9 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2019

Evaluate the determinant: $\begin{vmatrix} -1 & 2 & -3 \\ 4 & 5 & 6 \\ -7 & 8 & -9 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2019

Evaluate the determinant: $\begin{vmatrix} -1 & 2 & -3 \\ 4 & 5 & 6 \\ -7 & 8 & -9 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse with equation $27x^2 + 12y^2 + 108x - 72y - 108 = 0$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse with equation $27x^2 + 12y^2 + 108x - 72y - 108 = 0$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse with equation $27x^2 + 12y^2 + 108x - 72y - 108 = 0$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse with equation $27x^2 + 12y^2 + 108x - 72y - 108 = 0$.

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2019

Simplify: $(2a-3b-2c)-(4a-5b+2c)$

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2019

Simplify: $(2a-3b-2c)-(4a-5b+2c)$

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2019

Simplify: $(2a-3b-2c)-(4a-5b+2c)$

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2019

Simplify: $(2a-3b-2c)-(4a-5b+2c)$

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2019

Find the number of distinct permutations of the letters in the word BUBBLE.

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2019

Find the number of distinct permutations of the letters in the word BUBBLE.

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2019

Find the number of distinct permutations of the letters in the word BUBBLE.

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2019

Find the number of distinct permutations of the letters in the word BUBBLE.

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2019

Find the range, written in interval notation, of the function $y = \frac{x^2 - 8}{x^2 - 4}$.

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2019

Find the range, written in interval notation, of the function $y = \frac{x^2 - 8}{x^2 - 4}$.

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2019

Find the range, written in interval notation, of the function $y = \frac{x^2 - 8}{x^2 - 4}$.

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2019

Find the range, written in interval notation, of the function $y = \frac{x^2 - 8}{x^2 - 4}$.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2019

Todd's average score over the first three tests of the semester was an 88. Once Todd took the fourth test of the semester, his average across all four tests was a 91. Find the score that Todd made on the fourth test of the semester.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2019

Todd's average score over the first three tests of the semester was an 88. Once Todd took the fourth test of the semester, his average across all four tests was a 91. Find the score that Todd made on the fourth test of the semester.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2019

Todd's average score over the first three tests of the semester was an 88. Once Todd took the fourth test of the semester, his average across all four tests was a 91. Find the score that Todd made on the fourth test of the semester.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2019

Todd's average score over the first three tests of the semester was an 88. Once Todd took the fourth test of the semester, his average across all four tests was a 91. Find the score that Todd made on the fourth test of the semester.

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the arithmetic series:

$$10+13+16+\ldots+82$$

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the arithmetic series:

$$10+13+16+\ldots+82$$

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the arithmetic series:

$$10+13+16+\ldots+82$$

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the arithmetic series:

$$10+13+16+\ldots+82$$

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2019

Find the vertex of the parabola whose equation is $-4y+18=2x^2-12x$.

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2019

Find the vertex of the parabola whose equation is $-4y+18=2x^2-12x$.

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2019

Find the vertex of the parabola whose equation is $-4y+18=2x^2-12x$.

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2019

Find the vertex of the parabola whose equation is $-4y+18=2x^2-12x$.

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse whose equation is $3x^2 + 4y^2 - 12x + 8y - 32 = 0$.

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse whose equation is $3x^2 + 4y^2 - 12x + 8y - 32 = 0$.

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse whose equation is $3x^2 + 4y^2 - 12x + 8y - 32 = 0$.

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the ellipse whose equation is $3x^2 + 4y^2 - 12x + 8y - 32 = 0$.

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2019

Find the constant term in the expansion of

$\left(2x^2 - \frac{1}{x}\right)^9$.

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2019

Find the constant term in the expansion of

$\left(2x^2 - \frac{1}{x}\right)^9$.

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2019

Find the constant term in the expansion of

$\left(2x^2 - \frac{1}{x}\right)^9$.

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2019

Find the constant term in the expansion of

$\left(2x^2 - \frac{1}{x}\right)^9$.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2019

If $\cos\theta = \frac{\sqrt{7}}{3}$, where θ is an acute angle, find the value of $\tan\theta$.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2019

If $\cos\theta = \frac{\sqrt{7}}{3}$, where θ is an acute angle, find the value of $\tan\theta$.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2019

If $\cos\theta = \frac{\sqrt{7}}{3}$, where θ is an acute angle, find the value of $\tan\theta$.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2019

If $\cos\theta = \frac{\sqrt{7}}{3}$, where θ is an acute angle, find the value of $\tan\theta$.

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2019

If $f(x)=2x^2-1$ and $g(x)=\sqrt{x-3}$, find the domain, written in interval notation, of the composite function $(f\circ g)(x)$.

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2019

If $f(x)=2x^2-1$ and $g(x)=\sqrt{x-3}$, find the domain, written in interval notation, of the composite function $(f\circ g)(x)$.

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2019

If $f(x)=2x^2-1$ and $g(x)=\sqrt{x-3}$, find the domain, written in interval notation, of the composite function $(f\circ g)(x)$.

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2019

If $f(x)=2x^2-1$ and $g(x)=\sqrt{x-3}$, find the domain, written in interval notation, of the composite function $(f\circ g)(x)$.

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2019

"All complex numbers are imaginary numbers."

Determine whether this statement is true or false. (Please write either the full word "True" or the full word "False" as your answer.)

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2019

"All complex numbers are imaginary numbers."

Determine whether this statement is true or false. (Please write either the full word "True" or the full word "False" as your answer.)

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2019

"All complex numbers are imaginary numbers."

Determine whether this statement is true or false. (Please write either the full word "True" or the full word "False" as your answer.)

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2019

"All complex numbers are imaginary numbers."

Determine whether this statement is true or false. (Please write either the full word "True" or the full word "False" as your answer.)

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2019

Find the ordered pair solution to the system of equations: $\begin{cases} 5x+6y=-1 \\ 7x+8y=3 \end{cases}$

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2019

Find the ordered pair solution to the system of equations: $\begin{cases} 5x+6y=-1 \\ 7x+8y=3 \end{cases}$

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2019

Find the ordered pair solution to the system of equations: $\begin{cases} 5x+6y=-1 \\ 7x+8y=3 \end{cases}$

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2019

Find the ordered pair solution to the system of equations: $\begin{cases} 5x+6y=-1 \\ 7x+8y=3 \end{cases}$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2019

Evaluate, where $i = \sqrt{-1}$: $\left|-48 + 55i\right|$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2019

Evaluate, where $i = \sqrt{-1}$: $\left|-48 + 55i\right|$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2019

Evaluate, where $i = \sqrt{-1}$: $\left|-48 + 55i\right|$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2019

Evaluate, where $i = \sqrt{-1}$: $\left|-48 + 55i\right|$

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2019

How many real solutions does the equation $-3x^8+3x^4+3x^2+3=0$ have?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2019

How many real solutions does the equation $-3x^8+3x^4+3x^2+3=0$ have?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2019

How many real solutions does the equation $-3x^8+3x^4+3x^2+3=0$ have?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2019

How many real solutions does the equation $-3x^8+3x^4+3x^2+3=0$ have?

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2019

Let a_n be the nth term in a sequence. If $a_1 = 1$ and $a_n = a_{n-1} + (n-1)$ for all integers $n \geq 2$, find the numerical value of a_{2019}.

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2019

Let a_n be the nth term in a sequence. If $a_1 = 1$ and $a_n = a_{n-1} + (n-1)$ for all integers $n \geq 2$, find the numerical value of a_{2019}.

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2019

Let a_n be the nth term in a sequence. If $a_1 = 1$ and $a_n = a_{n-1} + (n-1)$ for all integers $n \geq 2$, find the numerical value of a_{2019}.

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2019

Let a_n be the nth term in a sequence. If $a_1 = 1$ and $a_n = a_{n-1} + (n-1)$ for all integers $n \geq 2$, find the numerical value of a_{2019}.

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2019

Find the equation of the non-vertical asymptote of the function with equation $y = \frac{2x^2 + x - 3}{x - 3}$.

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2019

Find the equation of the non-vertical asymptote of the function with equation $y = \frac{2x^2 + x - 3}{x - 3}$.

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2019

Find the equation of the non-vertical asymptote of the function with equation $y = \frac{2x^2 + x - 3}{x - 3}$.

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2019

Find the equation of the non-vertical asymptote of the function with equation $y = \frac{2x^2 + x - 3}{x - 3}$.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2019

Find the absolute maximum value of the function $f(x) = -3x^2 - 15x + 11$, written as a decimal.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2019

Find the absolute maximum value of the function $f(x) = -3x^2 - 15x + 11$, written as a decimal.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2019

Find the absolute maximum value of the function $f(x) = -3x^2 - 15x + 11$, written as a decimal.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2019

Find the absolute maximum value of the function $f(x) = -3x^2 - 15x + 11$, written as a decimal.

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the infinite geometric series whose first term is $-\frac{5}{3}$ and whose fourth term is $\frac{45}{64}$.

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the infinite geometric series whose first term is $-\frac{5}{3}$ and whose fourth term is $\frac{45}{64}$.

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the infinite geometric series whose first term is $-\frac{5}{3}$ and whose fourth term is $\frac{45}{64}$.

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2019

Find the sum of the infinite geometric series whose first term is $-\frac{5}{3}$ and whose fourth term is $\frac{45}{64}$.

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the triangle whose vertices are located at the points $(2,-4)$, $(-1,-3)$, and $(-5,2)$. Write your answer as a fraction.

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the triangle whose vertices are located at the points $(2,-4)$, $(-1,-3)$, and $(-5,2)$. Write your answer as a fraction.

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the triangle whose vertices are located at the points $(2,-4)$, $(-1,-3)$, and $(-5,2)$. Write your answer as a fraction.

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2019

Find the area enclosed by the triangle whose vertices are located at the points $(2,-4)$, $(-1,-3)$, and $(-5,2)$. Write your answer as a fraction.

Answer : _____

Round 1 2 3 4 5