#1 Algebra 2 – Hustle
MAΘ National Convention 2022

If f(x) = $\begin{cases} \sqrt{x+4} & for\ x > 4 \\ x^2 - 1 & for\ x \leq 4 \end{cases}$

Evaluate f(f(f((-2)))

Answer : _____

Round 1 2 3 4 5

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#2 Algebra 2 – Hustle
MAΘ National Convention 2022

$-3x + 2y + 4z = 10$
$-y - 2z = 8$
$7x + 3y + 2z = -2$

Find the sum of $x + y + z$

Answer : _____

Round 1 2 3 4 5

#2 Algebra 2 – Hustle
MAΘ National Convention 2022

$-3x + 2y + 4z = 10$
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Answer : _____

Round 1 2 3 4 5

#3 Algebra 2 – Hustle
MAΘ National Convention 2022

Determine the sum of the reciprocal of the roots for the following polynomial equation:

$x^3 - 3x + 2 = 0$

Answer : _____

Round 1 2 3 4 5

#3 Algebra 2 – Hustle
MAΘ National Convention 2022

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Round 1 2 3 4 5

#4 Algebra 2 – Hustle
MAΘ National Convention 2022

Determine the sum of the first 10 numbers in an arithmetic sequence with $a_1 = -3$ and $a_{17} = 29$?

Answer : _____

Round 1 2 3 4 5

#4 Algebra 2 – Hustle
MAΘ National Convention 2022

Determine the sum of the first 10 numbers in an arithmetic sequence with $a_1 = -3$ and $a_{17} = 29$?

Answer : _____

Round 1 2 3 4 5

#4 Algebra 2 – Hustle
MAΘ National Convention 2022

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#4 Algebra 2 – Hustle
MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5

#5 Algebra 2 – Hustle
MAΘ National Convention 2022

What is the value of $\log_2 C^{\frac{4}{3}}$ if C = $\sqrt[3]{\sqrt{8}}$?

Answer : _____

Round 1 2 3 4 5

#5 Algebra 2 – Hustle
MAΘ National Convention 2022

What is the value of $\log_2 C^{\frac{4}{3}}$ if C = $\sqrt[3]{\sqrt{8}}$?

Answer : _____

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#6 Algebra 2 – Hustle
MAΘ National Convention 2022

Given $4x - \frac{2}{3}y = 8$ and $kx - 15y = 17$

Find the value of k that makes the two equations perpendicular.

Answer : _____

Round 1 2 3 4 5

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MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5

#7 Algebra 2 – Hustle
MAΘ National Convention 2022

How many terms are in the expansion of $(a + b + c + d + e)^7$?

Answer : _____

Round 1 2 3 4 5

#7 Algebra 2 – Hustle
MAΘ National Convention 2022

How many terms are in the expansion of $(a + b + c + d + e)^7$?

Answer : _____

Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#7 Algebra 2 – Hustle
MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5

#8 Algebra 2 – Hustle
MAΘ National Convention 2022

The roots of a polynomial H(x) are 2, -2, 3, and 4. The constant term of H(x) is 24. Find the sum of the coefficients of H(x).

Answer : _____

Round 1 2 3 4 5

#8 Algebra 2 – Hustle
MAΘ National Convention 2022

The roots of a polynomial H(x) are 2, -2, 3, and 4. The constant term of H(x) is 24. Find the sum of the coefficients of H(x).

Answer : _____

Round 1 2 3 4 5

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Answer : _____

Round 1 2 3 4 5

#9 Algebra 2 – Hustle
MAΘ National Convention 2022

$$\frac{3}{x^2-5x-6}=\frac{a}{x-3}+\frac{b}{x-2}$$

What is the sum of a + b?

Answer : _____

Round 1 2 3 4 5

#9 Algebra 2 – Hustle
MAΘ National Convention 2022

$$\frac{3}{x^2-5x-6}=\frac{a}{x-3}+\frac{b}{x-2}$$

What is the sum of a + b?

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MAΘ National Convention 2022

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MAΘ National Convention 2022

$$\frac{3}{x^2-5x-6}=\frac{a}{x-3}+\frac{b}{x-2}$$

What is the sum of a + b?

Answer : _____

Round 1 2 3 4 5

#10 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate

$$\log_{10}\frac{1}{2}+\log_{10}\frac{2}{3}+\log_{10}\frac{3}{4}+\cdots+\log_{10}\frac{99}{100}$$

Answer : _____

Round 1 2 3 4 5

#10 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate

$$\log_{10}\frac{1}{2}+\log_{10}\frac{2}{3}+\log_{10}\frac{3}{4}+\cdots+\log_{10}\frac{99}{100}$$

Answer : _____

Round 1 2 3 4 5

#10 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate

$$\log_{10}\frac{1}{2}+\log_{10}\frac{2}{3}+\log_{10}\frac{3}{4}+\cdots+\log_{10}\frac{99}{100}$$

Answer : _____

Round 1 2 3 4 5

#10 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate

$$\log_{10}\frac{1}{2}+\log_{10}\frac{2}{3}+\log_{10}\frac{3}{4}+\cdots+\log_{10}\frac{99}{100}$$

Answer : _____

Round 1 2 3 4 5

#11 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate $\sum_{k=1}^{10} k^3$

Answer : _____

Round 1 2 3 4 5

#11 Algebra 2 – Hustle
MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5

#11 Algebra 2 – Hustle
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Round 1 2 3 4 5

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MAΘ National Convention 2022

Evaluate $\sum_{k=1}^{10} k^3$

Answer : _____

Round 1 2 3 4 5

#12 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the sum of all integers n such that
$\lfloor n/3 \rfloor = 4$

Answer : _____

Round 1 2 3 4 5

#12 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the sum of all integers n such that
$\lfloor n/3 \rfloor = 4$

Answer : _____

Round 1 2 3 4 5

#12 Algebra 2 – Hustle
MAΘ National Convention 2022

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$\lfloor n/3 \rfloor = 4$

Answer : _____

Round 1 2 3 4 5

#12 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the sum of all integers n such that
$\lfloor n/3 \rfloor = 4$

Answer : _____

Round 1 2 3 4 5

#13 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the slant asymptote of

$f(x) = \frac{(x-2)(3x-1)}{x+1}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the slant asymptote of

$f(x) = \frac{(x-2)(3x-1)}{x+1}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the slant asymptote of

$f(x) = \frac{(x-2)(3x-1)}{x+1}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the slant asymptote of

$f(x) = \frac{(x-2)(3x-1)}{x+1}$

Answer : _____

Round 1 2 3 4 5

#14 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate $\log_4(256^{2020})$

Answer : _____

Round 1 2 3 4 5

#14 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate $\log_4(256^{2020})$

Answer : _____

Round 1 2 3 4 5

#14 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate $\log_4(256^{2020})$

Answer : _____

Round 1 2 3 4 5

#14 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate $\log_4(256^{2020})$

Answer : _____

Round 1 2 3 4 5

#15 Trigonometry – Hustle
MAΘ National Convention 2022

Find the sum of the solutions to

$x = \sqrt{2x + 35}$

Answer : _____

Round 1 2 3 4 5

#15 Trigonometry – Hustle
MAΘ National Convention 2022

Find the sum of the solutions to

$x = \sqrt{2x + 35}$

Answer : _____

Round 1 2 3 4 5

#15 Algebra 2 – Hustle
MAΘ National Convention 2022

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$x = \sqrt{2x + 35}$

Answer : _____

Round 1 2 3 4 5

#15 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the sum of the solutions to

$x = \sqrt{2x + 35}$

Answer : _____

Round 1 2 3 4 5

#16 Algebra 2 – Hustle
MAΘ National Convention 2022

If $3^x = 6$, find the value of 9^{x-1}

Answer : _____

Round 1 2 3 4 5

#16 Algebra 2 – Hustle
MAΘ National Convention 2022

If $3^x = 6$, find the value of 9^{x-1}

Answer : _____

Round 1 2 3 4 5

#16 Algebra 2 – Hustle
MAΘ National Convention 2022

If $3^x = 6$, find the value of 9^{x-1}

Answer : _____

Round 1 2 3 4 5

#16 Algebra 2 – Hustle
MAΘ National Convention 2022

If $3^x = 6$, find the value of 9^{x-1}

Answer : _____

Round 1 2 3 4 5

#17 Algebra 2 – Hustle
MAΘ National Convention 2022

Simplify $\frac{5+12i}{2-3i}$.

Express answer in a + bi form, where a and b are real numbers

Answer : _____

Round 1 2 3 4 5

#17 Algebra 2 – Hustle
MAΘ National Convention 2022

Simplify $\frac{5+12i}{2-3i}$.

Express answer in a + bi form, where a and b are real numbers

Answer : _____

Round 1 2 3 4 5

#17 Algebra 2 – Hustle
MAΘ National Convention 2022

Simplify $\frac{5+12i}{2-3i}$.

Express answer in a + bi form, where a and b are real numbers

Answer : _____

Round 1 2 3 4 5

#17 Algebra 2 – Hustle
MAΘ National Convention 2022

Simplify $\frac{5+12i}{2-3i}$.

Express answer in a + bi form, where a and b are real numbers

Answer : _____

Round 1 2 3 4 5

#18 Algebra 2 – Hustle
MAΘ National Convention 2022

For what value(s) of k is x – 1 a factor of

$x^3 + 3kx^2 + k^2x + k - 1$?

Answer : _____

Round 1 2 3 4 5

#18 Algebra 2 – Hustle
MAΘ National Convention 2022

For what value(s) of k is x – 1 a factor of

$x^3 + 3kx^2 + k^2x + k - 1$?

Answer : _____

Round 1 2 3 4 5

#18 Algebra 2 – Hustle
MAΘ National Convention 2022

For what value(s) of k is x – 1 a factor of

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Answer : _____

Round 1 2 3 4 5

#18 Algebra 2 – Hustle
MAΘ National Convention 2022

For what value(s) of k is x – 1 a factor of

$x^3 + 3kx^2 + k^2x + k - 1$?

Answer : _____

Round 1 2 3 4 5

#19 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the area of the conic defined by the equation $4x^2 + 9y^2 – 8x + 90y + 193 = 0$

Answer : _____

Round 1 2 3 4 5

#19 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the area of the conic defined by the equation $4x^2 + 9y^2 – 8x + 90y + 193 = 0$

Answer : _____

Round 1 2 3 4 5

#19 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the area of the conic defined by the equation $4x^2 + 9y^2 – 8x + 90y + 193 = 0$

Answer : _____

Round 1 2 3 4 5

#19 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the area of the conic defined by the equation $4x^2 + 9y^2 – 8x + 90y + 193 = 0$

Answer : _____

Round 1 2 3 4 5

#20 Algebra 2 – Hustle
MAΘ National Convention 2022

Let $f(x) = x^{10} – 2x^6 + 4$. Find the remainder when $f(x)$ is divided by $7x – 14$.

Answer : _____

Round 1 2 3 4 5

#20 Algebra 2 – Hustle
MAΘ National Convention 2022

Let $f(x) = x^{10} – 2x^6 + 4$. Find the remainder when $f(x)$ is divided by $7x – 14$.

Answer : _____

Round 1 2 3 4 5

#20 Algebra 2 – Hustle
MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5

#20 Algebra 2 – Hustle
MAΘ National Convention 2022

Let $f(x) = x^{10} – 2x^6 + 4$. Find the remainder when $f(x)$ is divided by $7x – 14$.

Answer : _____

Round 1 2 3 4 5

#21 Algebra 2 – Hustle
MAΘ National Convention 2022

The circle $x^2 = 6x - 2y + 10 - y^2$ is inscribed within a square. What is the area of the square?

Answer : _____

Round 1 2 3 4 5

#21 Algebra 2 – Hustle
MAΘ National Convention 2022

The circle $x^2 = 6x - 2y + 10 - y^2$ is inscribed within a square. What is the area of the square?

Answer : _____

Round 1 2 3 4 5

#21 Algebra 2 – Hustle
MAΘ National Convention 2022

The circle $x^2 = 6x - 2y + 10 - y^2$ is inscribed within a square. What is the area of the square?

Answer : _____

Round 1 2 3 4 5

#21 Algebra 2 – Hustle
MAΘ National Convention 2022

The circle $x^2 = 6x - 2y + 10 - y^2$ is inscribed within a square. What is the area of the square?

Answer : _____

Round 1 2 3 4 5

#22 Algebra 2 – Hustle
MAΘ National Convention 2022

Find $|(2 + 2i)^6|$

Answer : _____

Round 1 2 3 4 5

#22 Algebra 2 – Hustle
MAΘ National Convention 2022

Find $|(2 + 2i)^6|$

Answer : _____

Round 1 2 3 4 5

#22 Algebra 2 – Hustle
MAΘ National Convention 2022

Find $|(2 + 2i)^6|$

Answer : _____

Round 1 2 3 4 5

#22 Algebra 2 – Hustle
MAΘ National Convention 2022

Find $|(2 + 2i)^6|$

Answer : _____

Round 1 2 3 4 5

#23 Algebra 2 – Hustle
MAΘ National Convention 2022

How many ways can six students stand in a straight line if two students refuse to stand next to one another?

Answer : _____

Round 1 2 3 4 5

#23 Algebra 2 – Hustle
MAΘ National Convention 2022

How many ways can six students stand in a straight line if two students refuse to stand next to one another?

Answer : _____

Round 1 2 3 4 5

#23 Algebra 2 – Hustle
MAΘ National Convention 2022

How many ways can six students stand in a straight line if two students refuse to stand next to one another?

Answer : _____

Round 1 2 3 4 5

#23 Algebra 2 – Hustle
MAΘ National Convention 2022

How many ways can six students stand in a straight line if two students refuse to stand next to one another?

Answer : _____

Round 1 2 3 4 5

#24 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate the series: $\frac{1}{2}+\frac{2}{6}+\frac{3}{18}+\frac{4}{54}+\ldots$

Answer : _____

Round 1 2 3 4 5

#24 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate the series: $\frac{1}{2}+\frac{2}{6}+\frac{3}{18}+\frac{4}{54}+\ldots$

Answer : _____

Round 1 2 3 4 5

#24 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate the series: $\frac{1}{2}+\frac{2}{6}+\frac{3}{18}+\frac{4}{54}+\ldots$

Answer : _____

Round 1 2 3 4 5

#24 Algebra 2 – Hustle
MAΘ National Convention 2022

Evaluate the series: $\frac{1}{2}+\frac{2}{6}+\frac{3}{18}+\frac{4}{54}+\ldots$

Answer : _____

Round 1 2 3 4 5

#25 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the eccentricity of the following conic:

$$\frac{(y-3)^2}{25} - \frac{(x+1)^2}{144} = 1$$

Answer : _____

Round 1 2 3 4 5

#25 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the eccentricity of the following conic:

$$\frac{(y-3)^2}{25} - \frac{(x+1)^2}{144} = 1$$

Answer : _____

Round 1 2 3 4 5

#25 Algebra 2 – Hustle
MAΘ National Convention 2022

Find the eccentricity of the following conic:

$$\frac{(y-3)^2}{25} - \frac{(x+1)^2}{144} = 1$$

Answer : _____

Round 1 2 3 4 5

#25 Algebra 2 – Hustle
MAΘ National Convention 2022

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Answer : _____

Round 1 2 3 4 5