#1 Algebra II - Hustle MAO National Convention 2025

If $f(x)=3x^2-1$ and $g(x)=x^3+1$, find f(g(f(g(g(-1))))).

#1 Algebra II - Hustle MAO National Convention 2025

If $f(x)=3x^2-1$ and $g(x)=x^3+1$, find f(g(f(g(g(-1))))).

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#1 Algebra II - Hustle MAO National Convention 2025

If $f(x)=3x^2-1$ and $g(x)=x^3+1$, find f(g(f(g(g(-1))))).

#1 Algebra II - Hustle MAO National Convention 2025

If $f(x)=3x^2-1$ and $g(x)=x^3+1$, find f(g(f(g(g(-1))))).

Answer : _____

Answer : _____

Round 1 2 3 4 5

#2 Algebra II - Hustle MAO National Convention 2025

The graph of $y = \frac{x^4 - 2x^3 - 5x + 5}{x^2 + x + 2}$ has a parabolic asymptote whose equation can be written in the form $y = ax^2 + bx + c$. Find the value of $-b^{a+c}$.

#2 Algebra II - Hustle MAO National Convention 2025

The graph of $y = \frac{x^4 - 2x^3 - 5x + 5}{x^2 + x + 2}$ has a parabolic asymptote whose equation can be written in the form $y = ax^2 + bx + c$. Find the value of $-b^{a+c}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#2 Algebra II - Hustle MAO National Convention 2025

The graph of $y = \frac{x^4 - 2x^3 - 5x + 5}{x^2 + x + 2}$ has a parabolic asymptote whose equation can be written in the form $y = ax^2 + bx + c$. Find the value of $-b^{a+c}$.

#2 Algebra II - Hustle MAO National Convention 2025

The graph of $y = \frac{x^4 - 2x^3 - 5x + 5}{x^2 + x + 2}$ has a parabolic asymptote whose equation can be written in the form $y = ax^2 + bx + c$. Find the value of $-b^{a+c}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#3 Algebra II - Hustle MAO National Convention 2025

Let the three solutions to

$$\begin{vmatrix} 2x^2 + 1 & 10 \\ x - 1 & x + 2 \end{vmatrix} = 7x^2 + 9x + 20 \text{ be } a, b, \text{ and } c,$$

where a < b < c. What is the value of c?

#3 Algebra II - Hustle MAO National Convention 2025

Let the three solutions to

$$\begin{vmatrix} 2x^2 + 1 & 10 \\ x - 1 & x + 2 \end{vmatrix} = 7x^2 + 9x + 20 \text{ be } a, b, \text{ and } c,$$

where a < b < c. What is the value of c?

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#3 Algebra II - Hustle MAO National Convention 2025

Let the three solutions to

$$\begin{vmatrix} 2x^2 + 1 & 10 \\ x - 1 & x + 2 \end{vmatrix} = 7x^2 + 9x + 20 \text{ be } a, b, \text{ and } c,$$

where a < b < c. What is the value of c?

#3 Algebra II - Hustle MAO National Convention 2025

Let the three solutions to

$$\begin{vmatrix} 2x^2 + 1 & 10 \\ x - 1 & x + 2 \end{vmatrix} = 7x^2 + 9x + 20 \text{ be } a, b, \text{ and } c,$$

where a < b < c. What is the value of c?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#4 Algebra II - Hustle MAO National Convention 2025

The domain of $y = \log_{x-8}(x^2 - 4x - 21)$ can be written in the form $(a, b) \cup (c, d)$. Find the value of a+b-c.

#4 Algebra II - Hustle MAO National Convention 2025

The domain of $y = \log_{x-8}(x^2 - 4x - 21)$ can be written in the form $(a, b) \cup (c, d)$. Find the value of a+b-c.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#4 Algebra II - Hustle MAO National Convention 2025

The domain of $y = \log_{x-8}(x^2 - 4x - 21)$ can be written in the form $(a, b) \cup (c, d)$. Find the value of a+b-c.

#4 Algebra II - Hustle MAO National Convention 2025

The domain of $y = \log_{x-8}(x^2 - 4x - 21)$ can be written in the form $(a, b) \cup (c, d)$. Find the value of a+b-c.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#5 Algebra II - Hustle MAO National Convention 2025

If
$$\frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$$
, find the value of
$$If \frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$$
, find the value of

#5 Algebra II - Hustle MAO National Convention 2025

If
$$\frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$$
, find the value of B^A .

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#5 Algebra II - Hustle **MAO National Convention 2025**

If
$$\frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$$
, find the value of B^A .

If $\frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$, find the value of B^A .

#5 Algebra II - Hustle **MAO National Convention 2025**

If
$$\frac{7x-25}{x^2-7x+12} = \frac{A}{x-3} + \frac{B}{x-4}$$
, find the value of B^A .

Answer : _____

Answer : _____

Round 1 2 3 4 5

#6 Algebra II - Hustle MAO National Convention 2025

Find the value of x such that x+2 is the arithmetic mean of 4x+1 and x-9.

#6 Algebra II - Hustle MAO National Convention 2025

Find the value of x such that x+2 is the arithmetic mean of 4x+1 and x-9.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#6 Algebra II - Hustle MAO National Convention 2025

Find the value of x such that x+2 is the arithmetic mean of 4x+1 and x-9.

#6 Algebra II - Hustle MAO National Convention 2025

Find the value of x such that x+2 is the arithmetic mean of 4x+1 and x-9.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#7 Algebra II - Hustle MAO National Convention 2025

Find the remainder when $4x^4 - 8x^3 + 7x^2 - 5$ is divided by $x + \frac{1}{2}$.

#7 Algebra II - Hustle MAO National Convention 2025

Find the remainder when $4x^4 - 8x^3 + 7x^2 - 5$ is divided by $x + \frac{1}{2}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#7 Algebra II - Hustle MAO National Convention 2025

Find the remainder when $4x^4 - 8x^3 + 7x^2 - 5$ is divided by $x + \frac{1}{2}$.

#7 Algebra II - Hustle MAO National Convention 2025

Find the remainder when $4x^4 - 8x^3 + 7x^2 - 5$ is divided by $x + \frac{1}{2}$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#8 Algebra II - Hustle MAO National Convention 2025

A circle has (2, 2) and (-4, -6) as the endpoints of a diameter. If the area of the circle is $A\pi$, find A.

#8 Algebra II - Hustle MAO National Convention 2025

A circle has (2, 2) and (-4, -6) as the endpoints of a diameter. If the area of the circle is $A\pi$, find A.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#8 Algebra II - Hustle MAO National Convention 2025

A circle has (2, 2) and (-4, -6) as the endpoints of a diameter. If the area of the circle is $A\pi$, find A.

#8 Algebra II - Hustle MAO National Convention 2025

A circle has (2, 2) and (-4, -6) as the endpoints of a diameter. If the area of the circle is $A\pi$, find A.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#9 Algebra II	- Hustle	
MAO National	Convention	2025

Find the magnitude of (10+24i)(8-6i), where $i = \sqrt{-1}$.

#9 Algebra II - Hustle MAO National Convention 2025

Find the magnitude of (10+24i)(8-6i), where $i = \sqrt{-1}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#9 Algebra II - Hustle MAO National Convention 2025

Find the magnitude of (10+24i)(8-6i), where $i = \sqrt{-1}$.

#9 Algebra II - Hustle MAO National Convention 2025

Find the magnitude of (10+24i)(8-6i), where $i = \sqrt{-1}$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#10 Algebra II - Hustle MAO National Convention 2025

For what nonzero value of a does the equation $3^x a + 3^{1-x} = 3$ have a unique solution? Write your answer as a fraction in lowest terms.

#10 Algebra II - Hustle MAO National Convention 2025

For what nonzero value of a does the equation $3^x a + 3^{1-x} = 3$ have a unique solution? Write your answer as a fraction in lowest terms.

_	
Answer	
MII 3 W CI	

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#10 Algebra II - Hustle MAO National Convention 2025

For what nonzero value of a does the equation $3^x a + 3^{1-x} = 3$ have a unique solution? Write your answer as a fraction in lowest terms.

#10 Algebra II - Hustle MAO National Convention 2025

For what nonzero value of a does the equation $3^x a + 3^{1-x} = 3$ have a unique solution? Write your answer as a fraction in lowest terms.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#11 Algebra II - Hustle MAO National Convention 2025

Find the coefficient of the sixth term in the expansion of $(x^2-1)^{12}$ when the terms are written in descending powers of x.

#11 Algebra II - Hustle

MAO National Convention 2025

Find the coefficient of the sixth term in the expansion of $(x^2-1)^{12}$ when the terms are written in descending powers of x.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#11 Algebra II - Hustle MAO National Convention 2025

Find the coefficient of the sixth term in the expansion of $(x^2-1)^{12}$ when the terms are written in descending powers of x.

#11 Algebra II - Hustle **MAO National Convention 2025**

Find the coefficient of the sixth term in the expansion of $(x^2-1)^{12}$ when the terms are written in descending powers of x.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#12 Algebra II - Hustle MAO National Convention 2025

How many grams of pure carbonic acid must be added to 180 grams of a solution that is 35% carbonic acid to produce a solution that is 50% carbonic acid?

#12 Algebra II - Hustle MAO National Convention 2025

How many grams of pure carbonic acid must be added to 180 grams of a solution that is 35% carbonic acid to produce a solution that is 50% carbonic acid?

A		
Answer	•	
IMISVACI	•	

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#12 Algebra II - Hustle MAO National Convention 2025

How many grams of pure carbonic acid must be added to 180 grams of a solution that is 35% carbonic acid to produce a solution that is 50% carbonic acid?

#12 Algebra II - Hustle MAO National Convention 2025

How many grams of pure carbonic acid must be added to 180 grams of a solution that is 35% carbonic acid to produce a solution that is 50% carbonic acid?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#13 Algebra II - Hustle MAO National Convention 2025

Find f(7) if $f(x) = \frac{x^4 - 10x^2 + 9}{x^2 - 4x + 3}$.

#13 Algebra II - Hustle MAO National Convention 2025

Find f(7) if $f(x) = \frac{x^4 - 10x^2 + 9}{x^2 - 4x + 3}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#13 Algebra II - Hustle MA0 National Convention 2025

Find
$$f(7)$$
 if $f(x) = \frac{x^4 - 10x^2 + 9}{x^2 - 4x + 3}$.

#13 Algebra II - Hustle MAO National Convention 2025

Find
$$f(7)$$
 if $f(x) = \frac{x^4 - 10x^2 + 9}{x^2 - 4x + 3}$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#14 Algebra II - Hustle MAO National Convention 2025

Find the distance between the foci of $\frac{(x-7)^2}{9} + \frac{(y+3)^2}{25} = 1.$

#14 Algebra II - Hustle MAO National Convention 2025

Find the distance between the foci of $\frac{(x-7)^2}{9} + \frac{(y+3)^2}{25} = 1.$

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#14 Algebra II - Hustle MAO National Convention 2025

Find the distance between the foci of $\frac{(x-7)^2}{9} + \frac{(y+3)^2}{25} = 1.$

#14 Algebra II - Hustle MAO National Convention 2025

Find the distance between the foci of $\frac{(x-7)^2}{9} + \frac{(y+3)^2}{25} = 1.$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#15 Algebra II - Hustle MAO National Convention 2025

If $2^{-3x} = \frac{1}{1000}$, find the value of $2^x + 4\log_{100} 2^x$.

#15 Algebra II - Hustle MAO National Convention 2025

If $2^{-3x} = \frac{1}{1000}$, find the value of $2^x + 4\log_{100} 2^x$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#15 Algebra II - Hustle MAO National Convention 2025

If $2^{-3x} = \frac{1}{1000}$, find the value of $2^x + 4\log_{100} 2^x$.

#15 Algebra II - Hustle MAO National Convention 2025

If $2^{-3x} = \frac{1}{1000}$, find the value of $2^x + 4\log_{100} 2^x$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#16 Algebra II - Hustle MAO National Convention 2025

An airport shuttle service operates between an airport and downtown. It costs \$10 to ride the shuttle, and 300 people ride the shuttle each day. The shuttle company estimates that business will decrease by 15 passengers per day for each \$1 increase in fare. Find the fare that will maximize revenue.

#16 Algebra II - Hustle MAO National Convention 2025

An airport shuttle service operates between an airport and downtown. It costs \$10 to ride the shuttle, and 300 people ride the shuttle each day. The shuttle company estimates that business will decrease by 15 passengers per day for each \$1 increase in fare. Find the fare that will maximize revenue.

Answer:	
MISWCI .	

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#16 Algebra II - Hustle MAO National Convention 2025

An airport shuttle service operates between an airport and downtown. It costs \$10 to ride the shuttle, and 300 people ride the shuttle each day. The shuttle company estimates that business will decrease by 15 passengers per day for each \$1 increase in fare. Find the fare that will maximize revenue.

#16 Algebra II - Hustle MAO National Convention 2025

An airport shuttle service operates between an airport and downtown. It costs \$10 to ride the shuttle, and 300 people ride the shuttle each day. The shuttle company estimates that business will decrease by 15 passengers per day for each \$1 increase in fare. Find the fare that will maximize revenue.

Round 1 2 3 4 5

#17 Algebra II - Hustle MAO National Convention 2025

The nonterminating decimal 0.06006006... can be written as a fraction $\frac{a}{b}$. Find the value of a+b when the fraction is written in lowest terms.

#17 Algebra II - Hustle MAO National Convention 2025

The nonterminating decimal 0.06006006... can be written as a fraction $\frac{a}{b}$. Find the value of a+b when the fraction is written in lowest terms.

Amarican		
Answer	-	
	-	

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#17 Algebra II - Hustle MAO National Convention 2025

The nonterminating decimal 0.06006006... can be written as a fraction $\frac{a}{b}$. Find the value of a+b when the fraction is written in lowest terms.

#17 Algebra II - Hustle MAO National Convention 2025

The nonterminating decimal 0.06006006... can be written as a fraction $\frac{a}{b}$. Find the value of a+b when the fraction is written in lowest terms.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#18 Algebra II - Hustle MAO National Convention 2025

Find the sum of the coefficients in the quotient of $\frac{6x^5 - x^4 - 32x^3 - 20x^2 + 5x + 8}{2x - 3}$.

#18 Algebra II - Hustle MAO National Convention 2025

Find the sum of the coefficients in the quotient of $\frac{6x^5 - x^4 - 32x^3 - 20x^2 + 5x + 8}{2x - 3}$.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#18 Algebra II - Hustle MAO National Convention 2025

Find the sum of the coefficients in the quotient of $\frac{6x^5 - x^4 - 32x^3 - 20x^2 + 5x + 8}{2x - 3}$.

#18 Algebra II - Hustle MAO National Convention 2025

Find the sum of the coefficients in the quotient of $\frac{6x^5 - x^4 - 32x^3 - 20x^2 + 5x + 8}{2x - 3}$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#19 Algebra II - Hustle	
MAO National Convention 2	2025

How many integer solutions (a, b, c, d) to a+b+c+d=25 exist if $a \ge 1$, $b \ge 2$, $c \ge 3$, and $d \ge 4$?

#19 Algebra II - Hustle MAO National Convention 2025

How many integer solutions (a, b, c, d) to a+b+c+d=25 exist if $a \ge 1$, $b \ge 2$, $c \ge 3$, and $d \ge 4$?

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#19 Algebra II - Hustle MAO National Convention 2025

How many integer solutions (a, b, c, d) to a+b+c+d=25 exist if $a \ge 1, b \ge 2, c \ge 3$, and $d \ge 4$?

#19 Algebra II - Hustle MAO National Convention 2025

How many integer solutions (a, b, c, d) to a+b+c+d=25 exist if $a \ge 1$, $b \ge 2$, $c \ge 3$, and $d \ge 4$?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#20 Algebra II – Hustle MAO National Convention 2025

Find the x-intercept of $y = 3\log_8(x-4) + 2$, written as an improper fraction.

#20 Algebra II - Hustle MAO National Convention 2025

Find the x-intercept of $y = 3\log_8(x-4) + 2$, written as an improper fraction.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#20 Algebra II - Hustle MAO National Convention 2025

Find the x-intercept of $y = 3\log_8(x-4) + 2$, written as an improper fraction.

#20 Algebra II - Hustle MAO National Convention 2025

Find the x-intercept of $y = 3\log_8(x-4) + 2$, written as an improper fraction.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#21 Algebra II - Hustle MAO National Convention 2025

Find the value of a+b+c if

$$\sum_{n=5}^{10} (3n^2 - 2n + 1) = \sum_{n=1}^{6} (an^2 + bn + c).$$

#21 Algebra II - Hustle MAO National Convention 2025

Find the value of a+b+c if

$$\sum_{n=5}^{10} (3n^2 - 2n + 1) = \sum_{n=1}^{6} (an^2 + bn + c).$$

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#21 Algebra II - Hustle MAO National Convention 2025

Find the value of a+b+c if

$$\sum_{n=5}^{10} (3n^2 - 2n + 1) = \sum_{n=1}^{6} (an^2 + bn + c).$$

#21 Algebra II - Hustle MAO National Convention 2025

Find the value of a+b+c if

$$\sum_{n=5}^{10} (3n^2 - 2n + 1) = \sum_{n=1}^{6} (an^2 + bn + c).$$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#22 Algebra II - Hustle MAO National Convention 2025

The triangle with vertices (2, 3), (8, -1), and (-2, x) has an area of 24 units². The sum of all values of x for which this is true can be written in simplest terms as $\frac{a}{b}$. Find the value of a+b.

#22 Algebra II - Hustle MAO National Convention 2025

The triangle with vertices (2, 3), (8, -1), and (-2, x) has an area of 24 units². The sum of all values of x for which this is true can be written in simplest terms as $\frac{a}{b}$. Find the value of a + b.

_	
Answer	
MIISWCI	

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#22 Algebra II - Hustle MAO National Convention 2025

The triangle with vertices (2, 3), (8, -1), and (-2, x) has an area of 24 units². The sum of all values of x for which this is true can be written in simplest terms as $\frac{a}{b}$. Find the value of a + b.

#22 Algebra II - Hustle MAO National Convention 2025

The triangle with vertices (2, 3), (8, -1), and (-2, x) has an area of 24 units². The sum of all values of x for which this is true can be written in simplest terms as $\frac{a}{b}$. Find the value of a + b.

Answer : _____

Round 1 2 3 4 5

Answer : _____

#23 Algebra II – Hustle MAO National Convention 2025

If $f(x)=x^4-x^2+ax+b$ and f(1)=2 and f(2)=17, find the product of the roots of function f.

#23 Algebra II - Hustle MAO National Convention 2025

If $f(x)=x^4-x^2+ax+b$ and f(1)=2 and f(2)=17, find the product of the roots of function f.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#23 Algebra II - Hustle MAO National Convention 2025

If $f(x)=x^4-x^2+ax+b$ and f(1)=2 and f(2)=17, find the product of the roots of function f.

#23 Algebra II - Hustle MAO National Convention 2025

If $f(x)=x^4-x^2+ax+b$ and f(1)=2 and f(2)=17, find the product of the roots of function f.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#24 Algebra II - Hustle MAO National Convention 2025

How many real-number solutions are there for $x^4 + |x| = 10$?

#24 Algebra II - Hustle MAO National Convention 2025

How many real-number solutions are there for $x^4 + |x| = 10$?

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#24 Algebra II - Hustle MAO National Convention 2025

How many real-number solutions are there for $x^4 + |x| = 10$?

#24 Algebra II - Hustle MAO National Convention 2025

How many real-number solutions are there for $x^4 + |x| = 10$?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#25 Algebra II - Hustle MAO National Convention 2025

The graphs of $x^2 - 3y^2 = 1$ and 2x + 3y = 7 have an intersection in Quadrant IV. Find the sum of the coordinates of the point of intersection.

#25 Algebra II - Hustle MAO National Convention 2025

The graphs of $x^2 - 3y^2 = 1$ and 2x + 3y = 7 have an intersection in Quadrant IV. Find the sum of the coordinates of the point of intersection.

Answer : _____

Round 1 2 3 4 5

Answer : _____

Round 1 2 3 4 5

#25 Algebra II - Hustle MAO National Convention 2025

The graphs of $x^2 - 3y^2 = 1$ and 2x + 3y = 7 have an intersection in Quadrant IV. Find the sum of the coordinates of the point of intersection.

#25 Algebra II - Hustle MAO National Convention 2025

The graphs of $x^2 - 3y^2 = 1$ and 2x + 3y = 7 have an intersection in Quadrant IV. Find the sum of the coordinates of the point of intersection.

Answer : _____

Answer : _____

Round 1 2 3 4 5