#1 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = x^2 - x - 1$, what is $f(-4)$?

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = x^2 - x - 1$, what is $f(-4)$?

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = x^2 - x - 1$, what is $f(-4)$?

Answer : _____

Round 1 2 3 4 5

#1 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = x^2 - x - 1$, what is $f(-4)$?

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2015

Define $A\&B = A^3 + B^2 - 1$, where $A, B < 0$

What value C satisfies the equation
$(-3)\&C = 26$?

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2015

Define $A\&B = A^3 + B^2 - 1$, where $A, B < 0$

What value C satisfies the equation
$(-3)\&C = 26$?

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2015

Define $A\&B = A^3 + B^2 - 1$, where $A, B < 0$

What value C satisfies the equation
$(-3)\&C = 26$?

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle
MAΘ National Convention 2015

Define $A\&B = A^3 + B^2 - 1$, where $A, B < 0$

What value C satisfies the equation
$(-3)\&C = 26$?

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2015

Simplify: $2x - 4[(x-1)^2 - 8(5-x) + 2]$

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2015

Simplify: $2x - 4[(x-1)^2 - 8(5-x) + 2]$

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2015

Simplify: $2x - 4[(x-1)^2 - 8(5-x) + 2]$

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle
MAΘ National Convention 2015

Simplify: $2x - 4[(x-1)^2 - 8(5-x) + 2]$

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2015

Multiply: $(x-4y)(x^2-4xy+16y^2)$

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2015

Multiply: $(x-4y)(x^2-4xy+16y^2)$

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2015

Multiply: $(x-4y)(x^2-4xy+16y^2)$

Answer : _____

Round 1 2 3 4 5

#4 Algebra – Hustle
MAΘ National Convention 2015

Multiply: $(x-4y)(x^2-4xy+16y^2)$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2015

Which is of the following expressions is the largest? Write the corresponding letter in the answer slot.

A) 9^{99}
B) 99^{9}
C) $9^{9^{9}}$
D) $9^{9!}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2015

Which is of the following expressions is the largest? Write the corresponding letter in the answer slot.

A) 9^{99}
B) 99^{9}
C) $9^{9^{9}}$
D) $9^{9!}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2015

Which is of the following expressions is the largest? Write the corresponding letter in the answer slot.

A) 9^{99}
B) 99^{9}
C) $9^{9^{9}}$
D) $9^{9!}$

Answer : _____

Round 1 2 3 4 5

#5 Algebra – Hustle
MAΘ National Convention 2015

Which is of the following expressions is the largest? Write the corresponding letter in the answer slot.

A) 9^{99}
B) 99^{9}
C) $9^{9^{9}}$
D) $9^{9!}$

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2015

If $w^2 + v^2 = 133$ and $wv = -18$, find the positive value of $w - v$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2015

If $w^2 + v^2 = 133$ and $wv = -18$, find the positive value of $w - v$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2015

If $w^2 + v^2 = 133$ and $wv = -18$, find the positive value of $w - v$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle
MAΘ National Convention 2015

If $w^2 + v^2 = 133$ and $wv = -18$, find the positive value of $w - v$.

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2015

What is the slope of a line that is perpendicular to $14x - 38y = 100$?

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2015

What is the slope of a line that is perpendicular to $14x - 38y = 100$?

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2015

What is the slope of a line that is perpendicular to $14x - 38y = 100$?

Answer : _____

Round 1 2 3 4 5

#7 Algebra – Hustle
MAΘ National Convention 2015

What is the slope of a line that is perpendicular to $14x - 38y = 100$?

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2015

Find k if $2 - 4\ln(3) = \ln(k)$

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2015

Find k if $2 - 4\ln(3) = \ln(k)$

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2015

Find k if $2 - 4\ln(3) = \ln(k)$

Answer : _____

Round 1 2 3 4 5

#8 Algebra – Hustle
MAΘ National Convention 2015

Find k if $2 - 4\ln(3) = \ln(k)$

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2015

If two real numbers differ by 9, what is their least possible product?

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2015

If two real numbers differ by 9, what is their least possible product?

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2015

If two real numbers differ by 9, what is their least possible product?

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle
MAΘ National Convention 2015

If two real numbers differ by 9, what is their least possible product?

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2015

Find the remainder when $3x^5 - 2x^3 + x - 10$ is divided by $2x - 1$.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2015

Find the remainder when $3x^5 - 2x^3 + x - 10$ is divided by $2x - 1$.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2015

Find the remainder when $3x^5 - 2x^3 + x - 10$ is divided by $2x - 1$.

Answer : _____

Round 1 2 3 4 5

#10 Algebra – Hustle
MAΘ National Convention 2015

Find the remainder when $3x^5 - 2x^3 + x - 10$ is divided by $2x - 1$.

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2015

Let $A = \begin{bmatrix} -10 & 15 \\ 15 & 35 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 24 \\ -16 & -12 \end{bmatrix}$.

If $BA = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, what is $d - a$?

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2015

Let $A = \begin{bmatrix} -10 & 15 \\ 15 & 35 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 24 \\ -16 & -12 \end{bmatrix}$.

If $BA = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, what is $d - a$?

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2015

Let $A = \begin{bmatrix} -10 & 15 \\ 15 & 35 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 24 \\ -16 & -12 \end{bmatrix}$.

If $BA = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, what is $d - a$?

Answer : _____

Round 1 2 3 4 5

#11 Algebra – Hustle
MAΘ National Convention 2015

Let $A = \begin{bmatrix} -10 & 15 \\ 15 & 35 \end{bmatrix}$ and $B = \begin{bmatrix} 8 & 24 \\ -16 & -12 \end{bmatrix}$.

If $BA = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, what is $d - a$?

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2015

Find the simplest form of the fractional equivalent of $0.41\overline{666}$

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2015

Find the simplest form of the fractional equivalent of $0.41\overline{666}$

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2015

Find the simplest form of the fractional equivalent of $0.41\overline{666}$

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle
MAΘ National Convention 2015

Find the simplest form of the fractional equivalent of $0.41\overline{666}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x that satisfy the equation:
$9^{x-3} = 81^{x}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x that satisfy the equation:
$9^{x-3} = 81^{x}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x that satisfy the equation:
$9^{x-3} = 81^{x}$

Answer : _____

Round 1 2 3 4 5

#13 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x that satisfy the equation:
$9^{x-3} = 81^{x}$

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2015

Simplify $(3-5i)(-1-3i)$

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2015

Simplify $(3-5i)(-1-3i)$

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2015

Simplify $(3-5i)(-1-3i)$

Answer : _____

Round 1 2 3 4 5

#14 Algebra – Hustle
MAΘ National Convention 2015

Simplify $(3-5i)(-1-3i)$

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2015

Find the greatest real solution to the equation $3x^8 + 5x^4 = 2$, in radical form.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2015

Find the greatest real solution to the equation $3x^8 + 5x^4 = 2$, in radical form.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2015

Find the greatest real solution to the equation $3x^8 + 5x^4 = 2$, in radical form.

Answer : _____

Round 1 2 3 4 5

#15 Algebra – Hustle
MAΘ National Convention 2015

Find the greatest real solution to the equation $3x^8 + 5x^4 = 2$, in radical form.

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x so that $\begin{vmatrix} x & 2 & 3 \\ x^2 & 4 & 9 \\ 0 & 1 & 1 \end{vmatrix} = 0.$

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x so that $\begin{vmatrix} x & 2 & 3 \\ x^2 & 4 & 9 \\ 0 & 1 & 1 \end{vmatrix} = 0.$

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x so that $\begin{vmatrix} x & 2 & 3 \\ x^2 & 4 & 9 \\ 0 & 1 & 1 \end{vmatrix} = 0.$

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of all x so that $\begin{vmatrix} x & 2 & 3 \\ x^2 & 4 & 9 \\ 0 & 1 & 1 \end{vmatrix} = 0.$

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = \frac{3x-7}{2}$, what is $f^{-1}(2)$?

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = \frac{3x-7}{2}$, what is $f^{-1}(2)$?

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = \frac{3x-7}{2}$, what is $f^{-1}(2)$?

Answer : _____

Round 1 2 3 4 5

#17 Algebra – Hustle
MAΘ National Convention 2015

If $f(x) = \frac{3x-7}{2}$, what is $f^{-1}(2)$?

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2015

If (a, b) is the center of the graph of $4x^2 - 3y^2 - 8x + 18y = 35$, find ab.

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2015

If (a, b) is the center of the graph of $4x^2 - 3y^2 - 8x + 18y = 35$, find ab.

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2015

If (a, b) is the center of the graph of $4x^2 - 3y^2 - 8x + 18y = 35$, find ab.

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle
MAΘ National Convention 2015

If (a, b) is the center of the graph of $4x^2 - 3y^2 - 8x + 18y = 35$, find ab.

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2015

Simplify:

$\log_2 8 + \log_3 27 + \cdots + \log_n n^3 + \cdots + \log 1000$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2015

Simplify:

$\log_2 8 + \log_3 27 + \cdots + \log_n n^3 + \cdots + \log 1000$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2015

Simplify:

$\log_2 8 + \log_3 27 + \cdots + \log_n n^3 + \cdots + \log 1000$

Answer : _____

Round 1 2 3 4 5

#19 Algebra – Hustle
MAΘ National Convention 2015

Simplify:

$\log_2 8 + \log_3 27 + \cdots + \log_n n^3 + \cdots + \log 1000$

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2015

If one solution of $2x^4 - x^3 - 2x + 1 = 0$ is $x = 1$, what is the sum of the remaining solutions?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2015

If one solution of $2x^4 - x^3 - 2x + 1 = 0$ is $x = 1$, what is the sum of the remaining solutions?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2015

If one solution of $2x^4 - x^3 - 2x + 1 = 0$ is $x = 1$, what is the sum of the remaining solutions?

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle
MAΘ National Convention 2015

If one solution of $2x^4 - x^3 - 2x + 1 = 0$ is $x = 1$, what is the sum of the remaining solutions?

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2015

Find $d(-2)$ if d is a linear function so that $d(1) = -2$ and $d(3) = 6$

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2015

Find $d(-2)$ if d is a linear function so that $d(1) = -2$ and $d(3) = 6$

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2015

Find $d(-2)$ if d is a linear function so that $d(1) = -2$ and $d(3) = 6$

Answer : _____

Round 1 2 3 4 5

#21 Algebra – Hustle
MAΘ National Convention 2015

Find $d(-2)$ if d is a linear function so that $d(1) = -2$ and $d(3) = 6$

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2015

Find the 100th term in the arithmetic sequence: 17,11,5, −1 …

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2015

Find the 100th term in the arithmetic sequence: 17,11,5, −1 …

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2015

Find the 100th term in the arithmetic sequence: 17,11,5, −1 …

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle
MAΘ National Convention 2015

Find the 100th term in the arithmetic sequence: 17,11,5, −1 …

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2015

Solve for x if $\sqrt{11-x} = \sqrt{-5x} + 1$.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2015

Solve for x if $\sqrt{11-x} = \sqrt{-5x} + 1$.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2015

Solve for x if $\sqrt{11-x} = \sqrt{-5x} + 1$.

Answer : _____

Round 1 2 3 4 5

#23 Algebra – Hustle
MAΘ National Convention 2015

Solve for x if $\sqrt{11-x} = \sqrt{-5x} + 1$.

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of the geometric series:

$$18 + 12 + 8 + \frac{16}{3} + \cdots$$

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of the geometric series:

$$18 + 12 + 8 + \frac{16}{3} + \cdots$$

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of the geometric series:

$$18 + 12 + 8 + \frac{16}{3} + \cdots$$

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle
MAΘ National Convention 2015

Find the sum of the geometric series:

$$18 + 12 + 8 + \frac{16}{3} + \cdots$$

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2015

The ratio of boys to girls in your new class is 5 : 2. The total number of students in the class is 28. How many boys are in the class?

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2015

The ratio of boys to girls in your new class is 5 : 2. The total number of students in the class is 28. How many boys are in the class?

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2015

The ratio of boys to girls in your new class is 5 : 2. The total number of students in the class is 28. How many boys are in the class?

Answer : _____

Round 1 2 3 4 5

#25 Algebra – Hustle
MAΘ National Convention 2015

The ratio of boys to girls in your new class is 5 : 2. The total number of students in the class is 28. How many boys are in the class?

Answer : _____

Round 1 2 3 4 5