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

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#1 Algebra – Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#1 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

# #2 Algebra - Hustle MA⊕ National Convention 2015

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

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

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Round 1 2 3 4 5

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Answer : \_\_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#3 Algebra – Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#3 Algebra - Hustle MA® National Convention 2015

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

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#4 Algebra - Hustle MA® National Convention 2015

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

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

#4 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

## #5 Algebra – Hustle MA⊕ National Convention 2015

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

- A) 9<sup>99</sup>
- B) 99<sup>9</sup>
- c) 9<sup>99</sup>
- D) 9<sup>9!</sup>

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

### #5 Algebra – Hustle MA⊕ National Convention 2015

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

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- в) 99<sup>9</sup>
- c)  $9^{9^9}$
- D) 9<sup>9!</sup>

#### #5 Algebra - Hustle MA⊕ National Convention 2015

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- D) 9<sup>9!</sup>

Answer : \_\_\_\_\_

Round 1 2 3 4 5

## #5 Algebra – Hustle MA⊕ National Convention 2015

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- B) 99<sup>9</sup>
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- D) 9<sup>9!</sup>

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

# #6 Algebra - Hustle MA⊕ National Convention 2015

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

## #6 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

#6 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#6 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#7	Alge	ebra – l	Hustle	
MA	ΘΝ	ational	<b>Convention</b>	2015

### #7 Algebra – Hustle MA⊕ National Convention 2015

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

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Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

Round 1 2 3 4 5

## #7 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#8 Algebra – Hustle	
MA® National Convention 201	5

#8 Algebra - Hustle MA⊖ National Convention 2015

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

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#8 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#8 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

#9 Algebra – Hustle
MA⊕ National Convention 2015

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

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Answer		

Round 1 2 3 4 5

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

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

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#10 Algebra - Hustle	
MAO National Convent	tion 2015

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

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Round 1 2 3 4 5

# #10 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

## #10 Algebra - Hustle MA⊕ 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

Round 1 2 3 4 5

Answer : \_\_\_\_\_

# #11 Algebra - Hustle MA⊕ 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  $d - a$ ?

## #11 Algebra - Hustle MA⊕ National Convention 2015

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Round 1 2 3 4 5

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Round 1 2 3 4 5

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, what is  $d - a$ ?

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Round 1 2 3 4 5

Answer : \_\_\_\_\_

#12 Algebra - Hustle	
MA® National Convention	2015

#12 Algebra – Hustle MA⊕ National Convention 2015

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

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

Round 1 2 3 4 5

Answer : \_\_\_\_\_

#12 Algebra - Hustle MA⊕ National Convention 2015

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#12 Algebra - Hustle MA⊖ National Convention 2015

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Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#13 Algebra - Hustle	
MA <sub>O</sub> National Convention	2015

## #13 Algebra - Hustle MA⊕ National Convention 2015

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

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#13 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#13 Algebra - Hustle MA® National Convention 2015

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Answer : \_\_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#14 Algebra – Hustle MA⊖ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#14 Algebra – Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

#15 Algebra -	Hustle	
MA <sub>O</sub> National	Convention	2015

#15 Algebra – Hustle MA⊕ National Convention 2015

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

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

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

Round 1 2 3 4 5

Answer : \_\_\_\_\_

#15 Algebra - Hustle MA⊕ National Convention 2015

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#15 Algebra – Hustle MA© National Convention 2015

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Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

# #16 Algebra - Hustle MA⊕ National Convention 2015

#16 Algebra – Hustle MA⊕ National Convention 2015

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

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Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

#16 Algebra - Hustle MA⊕ 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 MA⊕ 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 : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

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

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

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

#17 Algebra - Hustle MA® 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 MA® National Convention 2015

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

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

# #18 Algebra - Hustle MA⊕ National Convention 2015

#18 Algebra – Hustle MA⊕ National Convention 2015

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

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 MA⊕ 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 MA® 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

Answer : \_\_\_\_\_

#19 Algebra -	Hustle	
<b>MAO National</b>	Convention	2015

## #19 Algebra - Hustle MA⊕ National Convention 2015

Simplify:

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

Simplify:

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

# #19 Algebra - Hustle MA⊕ National Convention 2015

MA® National Convention 2013

#19 Algebra - Hustle MA® National Convention 2015

Simplify:

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

Simplify:

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

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

# #20 Algebra - Hustle MA⊕ 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?

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Answer : \_\_\_\_\_\_

Round 1 2 3 4 5

## #20 Algebra - Hustle MA⊕ 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 MA⊕ 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 : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#21 Algebra - Hustle	
MA® National Convention 2	2015

### #21 Algebra – Hustle MA⊕ National Convention 2015

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

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

## #21 Algebra - Hustle MA® National Convention 2015

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

#21 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#22 Algebra – Hustle	
MA® National Convention	2015

#22 Algebra - Hustle MA⊕ National Convention 2015

Find the  $100^{\text{th}}$  term in the arithmetic sequence: 17,11,5,-1 ...

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#22 Algebra - Hustle MA⊕ National Convention 2015

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Answer : \_\_\_\_\_

Round 1 2 3 4 5

#22 Algebra - Hustle MA⊖ National Convention 2015

Find the  $100^{th}$  term in the arithmetic sequence: 17,11,5,-1...

Answer : \_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

# #23 Algebra – Hustle MA⊖ National Convention 2015

## #23 Algebra – Hustle MA⊕ National Convention 2015

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

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#23 Algebra - Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#23 Algebra – Hustle MA⊕ National Convention 2015

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

Answer : \_\_\_\_\_

Round 1 2 3 4 5

Answer : \_\_\_\_\_

# #24 Algebra - Hustle MA⊕ National Convention 2015

#### #24 Algebra – Hustle MA⊕ National Convention 2015

Find the sum of the geometric series:

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

Find the sum of the geometric series:

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

A		
Answer	:	

Round 1 2 3 4 5

Answer : \_\_\_\_\_

Round 1 2 3 4 5

# #24 Algebra - Hustle MA⊕ National Convention 2015

Find the sum of the geometric series:

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

## #24 Algebra – Hustle MA⊕ National Convention 2015

Find the sum of the geometric series:

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

Answer : \_\_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5

#### #25 Algebra - Hustle MA⊕ 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?

### #25 Algebra – Hustle MA⊕ National Convention 2015

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Ancrean	
Answer	

Round 1 2 3 4 5

### #25 Algebra - Hustle MA⊕ 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 MA⊕ 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 : \_\_\_\_\_\_

Answer : \_\_\_\_\_

Round 1 2 3 4 5