

Hustle Algebra Test #643



Hustle Algebra Test #643



Hustle Algebra Test #643



Hustle Algebra Test #643

#1 Alg	ebra 2 – I	lustle	
MAO N	lational C	onvention	2018

#1 Algebra 2 - Hustle MAO National Convention 2018

Evaluate 
$$\sum_{k=1}^{20} (2k^2 - k)$$

Evaluate  $\sum_{k=1}^{20} (2k^2 - k)$ 

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

Round 1 2 3 4 5

#1 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $\sum_{k=1}^{20} (2k^2 - k)$ 

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

Round 1 2 3 4 5

#1 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $\sum_{k=1}^{20} (2k^2 - k)$ 

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

Round 1 2 3 4 5

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

### #2 Algebra 2 - Hustle MAO National Convention 2018

#2 Algebra 2 - Hustle MAO National Convention 2018

Solve for x: 
$$(\frac{1}{9})^x = 27^{x-2}$$

Solve for x:  $(\frac{1}{9})^x = 27^{x-2}$ 

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

Round 1 2 3 4 5

#2 Algebra 2 - Hustle MAO National Convention 2018

Solve for x:  $\left(\frac{1}{9}\right)^x = 27^{x-2}$ 

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

Round 1 2 3 4 5

#2 Algebra 2 - Hustle MAO National Convention 2018

Solve for x:  $\left(\frac{1}{9}\right)^x = 27^{x-2}$ 

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

Round 1 2 3 4 5

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

Simplify 
$$\frac{1}{1 + \frac{1}{1 - \frac{1}{1 + i}}}$$

Simplify 
$$\frac{1}{1+\frac{1}{1-\frac{1}{1+i}}}$$

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

Round 1 2 3 4 5

#3 Algebra 2 - Hustle MAO National Convention 2018

Simplify 
$$\frac{1}{1+\frac{1}{1-\frac{1}{1+i}}}$$

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

Round 1 2 3 4 5

#3 Algebra 2 - Hustle MAO National Convention 2018

Simplify 
$$\frac{1}{1 + \frac{1}{1 - \frac{1}{1 + i}}}$$

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

Round 1 2 3 4 5

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

#4 Algebra 2 – Hustle	
MAO National Convention	2018

### #4 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $\log_{3\sqrt{3}} 729$ 

Evaluate  $\log_{3\sqrt{3}} 729$ 

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

Round 1 2 3 4 5

#4 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $\log_{3\sqrt{3}} 729$ 

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

Round 1 2 3 4 5

#4 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $\log_{3\sqrt{3}} 729$ 

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

Round 1 2 3 4 5

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

#### #5 Algebra 2 - Hustle MAO National Convention 2018

A parabolic arch has a height of 20 ft and a width at its base of 30 ft. How many feet high is the arch 6ft from its center?

# #5 Algebra 2 - Hustle MAO National Convention 2018

A parabolic arch has a height of 20 ft and a width at its base of 30 ft. How many feet high is the arch 6ft from its center?

Answer		
7112 W C1		

Round 1 2 3 4 5

#### #5 Algebra 2 - Hustle MAO National Convention 2018

A parabolic arch has a height of 20 ft and a width at its base of 30 ft. How many feet high is the arch 6ft from its center?

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

Round 1 2 3 4 5

# #5 Algebra 2 - Hustle MAO National Convention 2018

A parabolic arch has a height of 20 ft and a width at its base of 30 ft. How many feet high is the arch 6ft from its center?

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

Round 1 2 3 4 5

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

#### #6 Algebra 2 - Hustle MAO National Convention 2018

The endpoints of the major axis of an ellipse are (13, 0) and (-13, 0). The coordinates of the foci are  $(\sqrt{5}, 0)$  and  $(-\sqrt{5}, 0)$ . What is the area enclosed by the ellipse?

### #6 Algebra 2 - Hustle MAO National Convention 2018

The endpoints of the major axis of an ellipse are (13, 0) and (-13, 0). The coordinates of the foci are  $(\sqrt{5}, 0)$  and  $(-\sqrt{5}, 0)$ . What is the area enclosed by the ellipse?

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

Round 1 2 3 4 5

#6 Algebra 2 - Hustle MAO National Convention 2018

The endpoints of the major axis of an ellipse are (13, 0) and (-13, 0). The coordinates of the foci are  $(\sqrt{5}, 0)$  and  $(-\sqrt{5}, 0)$ . What is the area enclosed by the ellipse?

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

Round 1 2 3 4 5

#6 Algebra 2 - Hustle MAO National Convention 2018

The endpoints of the major axis of an ellipse are (13, 0) and (-13, 0). The coordinates of the foci are  $(\sqrt{5}, 0)$  and  $(-\sqrt{5}, 0)$ . What is the area enclosed by the ellipse?

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

Round 1 2 3 4 5

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

#### #7 Algebra 2 - Hustle MAO National Convention 2018

Two roots of a cubic polynomial with real coefficients are 4 – i and -6. Find the product of all the roots of this polynomial.

## #7 Algebra 2 - Hustle MAO National Convention 2018

Two roots of a cubic polynomial with real coefficients are 4 – i and -6. Find the product of all the roots of this polynomial.

Answer		
7112 W C1		

Round 1 2 3 4 5

# #7 Algebra 2 - Hustle MAO National Convention 2018

Two roots of a cubic polynomial with real coefficients are 4 – i and -6. Find the product of all the roots of this polynomial.

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

Round 1 2 3 4 5

#### #7 Algebra 2 - Hustle MAO National Convention 2018

Two roots of a cubic polynomial with real coefficients are 4 – i and -6. Find the product of all the roots of this polynomial.

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

Round 1 2 3 4 5

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

### #8 Algebra 2 - Hustle MAO National Convention 2018

# Let $p(x) = x^3 - 7x^2 + 11x - 23$ have roots a, b, and c. Find the value of $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$

# #8 Algebra 2 - Hustle MAO National Convention 2018

Let  $p(x) = x^3 - 7x^2 + 11x - 23$  have roots a, b, and c. Find the value of  $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$ 

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

Round 1 2 3 4 5

# #8 Algebra 2 - Hustle MAO National Convention 2018

Let  $p(x) = x^3 - 7x^2 + 11x - 23$  have roots a, b, and c. Find the value of  $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$ 

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

Round 1 2 3 4 5

#### #8 Algebra 2 - Hustle MAO National Convention 2018

Let  $p(x) = x^3 - 7x^2 + 11x - 23$  have roots a, b, and c. Find the value of  $\frac{1}{ab} + \frac{1}{bc} + \frac{1}{ca}$ 

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

Round 1 2 3 4 5

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

#### #9 Algebra 2 - Hustle MAO National Convention 2018

Two different 2-digit positive integers are randomly chosen and multiplied together. What is the probability that the resulting product is even?

# #9 Algebra 2 - Hustle MAO National Convention 2018

Two different 2-digit positive integers are randomly chosen and multiplied together. What is the probability that the resulting product is even?

A	_			
Answer	•			

Round 1 2 3 4 5

# #9 Algebra 2 - Hustle MAO National Convention 2018

Two different 2-digit positive integers are randomly chosen and multiplied together. What is the probability that the resulting product is even?

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

Round 1 2 3 4 5

# #9 Algebra 2 - Hustle MAO National Convention 2018

Two different 2-digit positive integers are randomly chosen and multiplied together. What is the probability that the resulting product is even?

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

Round 1 2 3 4 5

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

#10 Algebra 2 - Hustle	
MAO National Convention 2	2018

# Find all the roots of $f(x) = 6x^4 + 41x^3 + 88x^2 + 67x + 14$

### #10 Algebra 2 - Hustle MAO National Convention 2018

Find all the roots of  $f(x) = 6x^4 + 41x^3 + 88x^2 + 67x + 14$ 

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

Round 1 2 3 4 5

#10 Algebra 2 - Hustle MAO National Convention 2018

Find all the roots of  $f(x) = 6x^4 + 41x^3 + 88x^2 + 67x + 14$ 

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

Round 1 2 3 4 5

#10 Algebra 2 - Hustle MAO National Convention 2018

Find all the roots of  $f(x) = 6x^4 + 41x^3 + 88x^2 + 67x + 14$ 

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

Round 1 2 3 4 5

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

#11 Algebra 2 - Hustle MAO National Convention 2018	#11 Algebra 2 - Hustle MAO National Convention 2018			
How many positive integral factors does 720 have?	How many positive integral factors does 720 have?			
Answer :	Answer :			
Round 1 2 3 4 5	Round 1 2 3 4 5			
#11 Algebra 2 - Hustle MAO National Convention 2018	#11 Algebra 2 - Hustle MAO National Convention 2018			

have?

How many positive integral factors does 720

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

Round 1 2 3 4 5

How many positive integral factors does 720

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

Round 1 2 3 4 5

have?

#12 Algebra 2 - Hustle	
MAO National Convention	2018

### #12 Algebra 2 - Hustle MAO National Convention 2018

Express	69915	in	base	8
LADICSS	ひノノ15	111	Dasc	U

Express 699<sub>15</sub> in base 8

_			
Answ	or .		
~ II.> VV	CI .		

Round 1 2 3 4 5

### #12 Algebra 2 - Hustle MAO National Convention 2018

Express 699<sub>15</sub> in base 8

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

Round 1 2 3 4 5

#12 Algebra 2 - Hustle MAO National Convention 2018

Express 699<sub>15</sub> in base 8

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

Round 1 2 3 4 5

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

#13 Algebra 2 - Hustle MAO National Convention 2018	#13 Algebra 2 - Hustle MAO National Convention 2018		
What is the tens digit of $7^{2018}$ ?	What is the tens digit of $7^{2018}$ ?		
Answer :	Answer :		
Round 1 2 3 4 5	Round 1 2 3 4 5		
#13 Algebra 2 - Hustle	#13 Algebra 2 - Hustle		

#13 Algebra 2 - Hustle MAO National Convention 2018

**MAO National Convention 2018** 

What is the tens digit of  $7^{2018}$ ?

What is the tens digit of  $7^{2018}$ ?

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

Round 1 2 3 4 5

#14 Algebra 2 - Hustle	
MAO National Convention	2018

# #14 Algebra 2 - Hustle MAO National Convention 2018

Express  $.\overline{237}$  as an improper fraction

Express  $.\overline{237}$  as an improper fraction

_		
Answer		
1112 W CI		

Round 1 2 3 4 5

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

Round 1 2 3 4 5

### #14 Algebra 2 - Hustle MAO National Convention 2018

Express  $.\overline{237}$  as an improper fraction

#14 Algebra 2 - Hustle MAO National Convention 2018

Express  $.\overline{237}$  as an improper fraction

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

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

Round 1 2 3 4 5

#15 Algebra 2 - Hustle	
MAO National Convention	2018

#15 Algebra 2 - Hustle MAO National Convention 2018

Find the remainder when  $2x^{2018} + 1$  is divided by x - 1

Find the remainder when  $2x^{2018} + 1$  is divided by x - 1

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

Round 1 2 3 4 5

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

Round 1 2 3 4 5

#15 Algebra 2 - Hustle MAO National Convention 2018

Find the remainder when  $2x^{2018} + 1$  is divided by x - 1

#15 Algebra 2 - Hustle MAO National Convention 2018

Find the remainder when  $2x^{2018} + 1$  is divided by x - 1

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

Round 1 2 3 4 5

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

#### #16 Algebra 2 - Hustle MAO National Convention 2018

Find all sets of 4 consecutive positive integers such that the sum of the cubes of three of them equals the cube of the fourth.

# #16 Algebra 2 - Hustle MAO National Convention 2018

Find all sets of 4 consecutive positive integers such that the sum of the cubes of three of them equals the cube of the fourth.

Answer		
7112 W C1		

Round 1 2 3 4 5

#### #16 Algebra 2 - Hustle MAO National Convention 2018

Find all sets of 4 consecutive positive integers such that the sum of the cubes of three of them equals the cube of the fourth.

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

Round 1 2 3 4 5

#### #16 Algebra 2 - Hustle MAO National Convention 2018

Find all sets of 4 consecutive positive integers such that the sum of the cubes of three of them equals the cube of the fourth.

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

Round 1 2 3 4 5

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

#### #17 Algebra 2 - Hustle MAO National Convention 2018

Find the sum of the first nine terms of an arithmetic sequence of real numbers with 2 as the fifth term and 8 as the fourteenth term.

# #17 Algebra 2 - Hustle MAO National Convention 2018

Find the sum of the first nine terms of an arithmetic sequence of real numbers with 2 as the fifth term and 8 as the thirteenth term.

Answer		
7112 W C1		

Round 1 2 3 4 5

#### #17 Algebra 2 - Hustle MAO National Convention 2018

Find the sum of the first nine terms of an arithmetic sequence of real numbers with 2 as the fifth term and 8 as the thirteenth term.

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

Round 1 2 3 4 5

# #17 Algebra 2 - Hustle MAO National Convention 2018

Find the sum of the first nine terms of an arithmetic sequence of real numbers with 2 as the fifth term and 8 as the thirteenth term.

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

Round 1 2 3 4 5

Answer:

Evaluate: 
$$\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$$

Evaluate: 
$$\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$$

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

Round 1 2 3 4 5

#18 Algebra 2 - Hustle MAO National Convention 2018

Evaluate:  $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$ 

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

Round 1 2 3 4 5

#18 Algebra 2 - Hustle MAO National Convention 2018

Evaluate:  $\sqrt{6 + \sqrt{6 + \sqrt{6 + \dots}}}$ 

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

Round 1 2 3 4 5

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

#19 Algebra 2 - Hustle	
MAO National Convention	2018

What is the sum of the coefficients of the expansion of  $(2x + y - z)^{12}$ ?

#### #19 Algebra 2 - Hustle MAO National Convention 2018

What is the sum of the coefficients of the expansion of  $(2x + y - z)^{12}$ ?

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

Round 1 2 3 4 5

#19 Algebra 2 - Hustle MAO National Convention 2018

What is the sum of the coefficients of the expansion of  $(2x + y - z)^{12}$ ?

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

Round 1 2 3 4 5

#19 Algebra 2 - Hustle MAO National Convention 2018

What is the sum of the coefficients of the expansion of  $(2x + y - z)^{12}$ ?

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

Round 1 2 3 4 5

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

#20 Algebra 2 – Hustle	
MAO National Convention	2018

What is the abscissa of the highest point on the graph of  $f(x) = -2x^2 + 4x - 17$ ?

### #20 Algebra 2 - Hustle MAO National Convention 2018

What is the abscissa of the highest point on the graph of  $f(x) = -2x^2 + 4x - 17$ ?

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

Round 1 2 3 4 5

#20 Algebra 2 - Hustle MAO National Convention 2018

What is the abscissa of the highest point on the graph of  $f(x) = -2x^2 + 4x - 17$ ?

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

Round 1 2 3 4 5

#20 Algebra 2 - Hustle MAO National Convention 2018

What is the abscissa of the highest point on the graph of  $f(x) = -2x^2 + 4x - 17$ ?

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

Round 1 2 3 4 5

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

### #21 Algebra 2 - Hustle MAO National Convention 2018

#21 Algebra 2 - Hustle MAO National Convention 2018

Find all solutions to  $x = \sqrt{3x + 4}$ 

Find all solutions to  $x = \sqrt{3x + 4}$ 

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

Round 1 2 3 4 5

#21 Algebra 2 - Hustle MAO National Convention 2018

Find all solutions to  $x = \sqrt{3x + 4}$ 

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

Round 1 2 3 4 5

#21 Algebra 2 - Hustle MAO National Convention 2018

Find all solutions to  $x = \sqrt{3x + 4}$ 

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

Round 1 2 3 4 5

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

### #22 Algebra 2 - Hustle **MAO National Convention 2018**

$$A = \begin{bmatrix} 2 & 1 \\ -4 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} x & y \\ z & w \end{bmatrix} \qquad C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} x & y \\ z & w \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

If C is the product of matrices A and B, what is the sum of the entries of matrix B?

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

Round 1 2 3 4 5

### #22 Algebra 2 - Hustle **MAO National Convention 2018**

$$A = \begin{bmatrix} 2 & 1 \\ -4 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} x & y \\ z & w \end{bmatrix} \qquad C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} x & y \\ z & w \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

If C is the product of matrices A and B, what is the sum of the entries of matrix B?

#### #22 Algebra 2 - Hustle **MAO National Convention 2018**

$$A = \begin{bmatrix} 2 & 1 \\ -4 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} x & y \\ z & w \end{bmatrix} \qquad C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} x & y \\ z & w \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

If C is the product of matrices A and B, what is the sum of the entries of matrix B?

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

Round 1 2 3 4 5

#### #22 Algebra 2 - Hustle **MAO National Convention 2018**

$$A = \begin{bmatrix} 2 & 1 \\ -4 & 4 \end{bmatrix} \qquad B = \begin{bmatrix} x & y \\ z & w \end{bmatrix} \qquad C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

$$B = \begin{bmatrix} x & y \\ z & w \end{bmatrix}$$

$$C = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

If C is the product of matrices A and B, what is the sum of the entries of matrix B?

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

Round 1 2 3 4 5

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

### #23 Algebra 2 - Hustle MAO National Convention 2018

Find the exact value of the eccentricity of the conic given by the equation

$$\frac{x^2}{9} - \frac{y^2}{4} = 1$$

#### #23 Algebra 2 - Hustle MAO National Convention 2018

Find the exact value of the eccentricity of the conic given by the equation

$$\frac{x^2}{9} - \frac{y^2}{4} = 1$$

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

Round 1 2 3 4 5

#### #23 Algebra 2 - Hustle MAO National Convention 2018

Find the exact value of the eccentricity of the conic given by the equation

$$\frac{x^2}{9} - \frac{y^2}{4} = 1$$

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

Round 1 2 3 4 5

#### #23 Algebra 2 - Hustle MAO National Convention 2018

Find the exact value of the eccentricity of the conic given by the equation

$$\frac{x^2}{9} - \frac{y^2}{4} = 1$$

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

Round 1 2 3 4 5

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

### #24 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $i + 2i^2 + 3i^3 + 4i^4 + ... + ni^n + ... + 16i^{16}$ , where  $i = \sqrt{-1}$ 

### #24 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $i + 2i^2 + 3i^3 + 4i^4 + ... + ni^n + ... + 16i^{16}$ , where  $i = \sqrt{-1}$ 

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

Round 1 2 3 4 5

#24 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $i + 2i^2 + 3i^3 + 4i^4 + ... + ni^n + ... + 16i^{16}$ , where  $i = \sqrt{-1}$ 

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

Round 1 2 3 4 5

#24 Algebra 2 - Hustle MAO National Convention 2018

Evaluate  $i + 2i^2 + 3i^3 + 4i^4 + ... + ni^n + ... + 16i^{16}$ , where  $i = \sqrt{-1}$ 

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

Round 1 2 3 4 5

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

#### #25 Algebra 2 - Hustle MAO National Convention 2018

Find the quadratic with rational coefficients and quadratic term  $x^2$  that has  $-3 + 3\sqrt{6}$  as a root.

#### #25 Algebra 2 - Hustle MAO National Convention 2018

Find the quadratic with rational coefficients and quadratic term  $x^2$  that has  $-3 + 3\sqrt{6}$  as a root.

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

Round 1 2 3 4 5

#25 Algebra 2 - Hustle MAO National Convention 2018

Find the quadratic with rational coefficients and quadratic term  $x^2$  that has  $-3 + 3\sqrt{6}$  as a root.

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

Round 1 2 3 4 5

#25 Algebra 2 - Hustle MAO National Convention 2018

Find the quadratic with rational coefficients and quadratic term  $x^2$  that has  $-3 + 3\sqrt{6}$  as a root.

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

Round 1 2 3 4 5

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