#1 Algebra - Hustle	
MAΘ National Convention 2011	

Find the solution set to the inequality $x^2 < 3x + 4$, written in interval notation.

#1 Algebra - Hustle	
MA® National Convention	2011

Find the solution set to the inequality $x^2 < 3x + 4$, written in interval notation.

Answer : _____

Round 1 2 3 4 5

#1 Algebra - Hustle MA⊕ National Convention 2011

Find the solution set to the inequality $x^2 < 3x + 4$, written in interval notation.

Answer : _____

Round 1 2 3 4 5

#1 Algebra - Hustle MA® National Convention 2011

Find the solution set to the inequality $x^2 < 3x + 4$, written in interval notation.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#2 Algebra – Hustle	
MA® National Convention	2011

Find the value of k such that the point (3,k) is equidistant from the points (1,2) and (6,7).

#2 Algebra - Hustle	
MA® National Convention	2011

Find the value of k such that the point (3,k) is equidistant from the points (1,2) and (6,7).

Answer : ______

Round 1 2 3 4 5

#2 Algebra - Hustle MA⊕ National Convention 2011

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Answer : _____

Round 1 2 3 4 5

#2 Algebra - Hustle MA® National Convention 2011

Find the value of k such that the point (3,k) is equidistant from the points (1,2) and (6,7).

Answer : _____

Answer : _____

Round 1 2 3 4 5

#3 Algebra - Hustle MA⊕ National Convention 2011

Simplify:
$$\frac{n(n+1)!-2n!}{(n+1)!+n!}$$

#3 Algebra - Hustle MA® National Convention 2011

Simplify:
$$\frac{n(n+1)!-2n!}{(n+1)!+n!}$$

Answer:	

Round 1 2 3 4 5

#3 Algebra - Hustle MA⊕ National Convention 2011

Simplify:
$$\frac{n(n+1)!-2n!}{(n+1)!+n!}$$

Answer : _____

Round 1 2 3 4 5

#3 Algebra – Hustle MA⊕ National Convention 2011

Simplify:
$$\frac{n(n+1)!-2n!}{(n+1)!+n!}$$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#4 Algebra - Hustle MA⊕ National Convention 2011

For what values of k does the circle with equation $(x-k)^2 + (y-2k)^2 = 10$ pass through the point (1,1)?

#4 Algebra – Hustle MA⊖ National Convention 2011

For what values of k does the circle with equation $(x-k)^2 + (y-2k)^2 = 10$ pass through the point (1,1)?

Answer : ______

Round 1 2 3 4 5

#4 Algebra - Hustle MA© National Convention 2011

For what values of k does the circle with equation $(x-k)^2 + (y-2k)^2 = 10$ pass through the point (1,1)?

Answer : _____

Round 1 2 3 4 5

#4 Algebra - Hustle MA⊖ National Convention 2011

For what values of k does the circle with equation $(x-k)^2 + (y-2k)^2 = 10$ pass through the point (1,1)?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#5 Algebra - Hustle MA⊕ National Convention 2011

For what values of k will the line with equation kx+5y=2k be perpendicular to the line with equation 2x-3y=1?

#5 Algebra - Hustle MA⊕ National Convention 2011

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Answer	i.

Round 1 2 3 4 5

#5 Algebra - Hustle MA⊕ National Convention 2011

For what values of k will the line with equation kx+5y=2k be perpendicular to the line with equation 2x-3y=1?

Answer : _____

Round 1 2 3 4 5

#5 Algebra - Hustle MA⊕ National Convention 2011

For what values of k will the line with equation kx+5y=2k be perpendicular to the line with equation 2x-3y=1?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#6 Algebra – Hustle MA⊕ National Convention 2011

Let
$$f(x) = x^3 + x^2 + 2x - 1$$
. Simplify the expression $\frac{f(x+h) - f(x)}{h}$, where $h \neq 0$.

#6 Algebra - Hustle MA⊕ National Convention 2011

Let
$$f(x) = x^3 + x^2 + 2x - 1$$
. Simplify the expression $\frac{f(x+h) - f(x)}{h}$, where $h \ne 0$.

Answer:	

Round 1 2 3 4 5

#6 Algebra - Hustle MA⊕ National Convention 2011

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$$f(x) = x^3 + x^2 + 2x - 1$$
. Simplify the expression $\frac{f(x+h) - f(x)}{h}$, where $h \ne 0$.

Answer : _____

Round 1 2 3 4 5

#6 Algebra - Hustle MA© National Convention 2011

Let $f(x) = x^3 + x^2 + 2x - 1$. Simplify the expression $\frac{f(x+h) - f(x)}{h}$, where $h \ne 0$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#7 Algebra - Hustle MA⊕ National Convention 2011

The leading car rental company, Heat, charges \$30 per day and 15¢ per mile for a car rental. The second-ranking car rental company, Byrd, charges \$32 per day and 12¢ per mile for a car rental. If you expect to drive x miles per day, for what value of x would it cost the same amount to rent the car from either Heat or Byrd?

#7 Algebra - Hustle	
MA® National Convention	2011

The leading car rental company, Heat, charges \$30 per day and 15¢ per mile for a car rental. The second-ranking car rental company, Byrd, charges \$32 per day and 12¢ per mile for a car rental. If you expect to drive *x* miles per day, for what value of *x* would it cost the same amount to rent the car from either Heat or Byrd?

Answer	1	
7 1113 VV C1	1	

Round 1 2 3 4 5

#7 Algebra - Hustle MA⊕ National Convention 2011

The leading car rental company, Heat, charges \$30 per day and 15¢ per mile for a car rental. The second-ranking car rental company, Byrd, charges \$32 per day and 12¢ per mile for a car rental. If you expect to drive x miles per day, for what value of x would it cost the same amount to rent the car from either Heat or Byrd?

Answer : _____

Round 1 2 3 4 5

#7 Algebra - Hustle MA⊖ National Convention 2011

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Answer : _____

Round 1 2 3 4 5

Answer : _____

#8 Algebra - Hustle MA⊕ National Convention 2011

Find all real roots of the function $f(x) = x^4 - 10x^2 + 9$.

#8 Algebra - Hustle MA⊕ National Convention 2011

Find all real roots of the function $f(x) = x^4 - 10x^2 + 9$.

_		
Answer:		

Round 1 2 3 4 5

#8 Algebra - Hustle MA⊕ National Convention 2011

Find all real roots of the function $f(x) = x^4 - 10x^2 + 9$.

Answer : _____

Round 1 2 3 4 5

#8 Algebra - Hustle MA© National Convention 2011

Find all real roots of the function $f(x) = x^4 - 10x^2 + 9$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#9 Algebra – Hustle MA⊕ National Convention 2011

#9 Algebra – Hustle MA⊕ National Convention 2011

Solve the equation: $_{w+1}C_2 = 9(_wC_1)$

Solve the equation: $_{w+1}C_2 = 9(_wC_1)$

Answer : _____

Answer : _____

Round 1 2 3 4 5

Round 1 2 3 4 5

#9 Algebra - Hustle MA⊕ National Convention 2011 #9 Algebra - Hustle MA⊕ National Convention 2011

Solve the equation: $_{w+1}C_2 = 9(_wC_1)$

Solve the equation: $_{w+1}C_2 = 9(_wC_1)$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#10 Algebra - Hustle MA⊕ National Convention 2011

The length of a rectangle is 1 less than three times its width. The perimeter of the rectangle is 46. Find the dimensions of the rectangle.

#10 Algebra - Hustle MA⊕ National Convention 2011

The length of a rectangle is 1 less than three times its width. The perimeter of the rectangle is 46. Find the dimensions of the rectangle.

_		
Answer:		

Round 1 2 3 4 5

#10 Algebra - Hustle MA⊕ National Convention 2011

The length of a rectangle is 1 less than three times its width. The perimeter of the rectangle is 46. Find the dimensions of the rectangle.

Answer : _____

Round 1 2 3 4 5

#10 Algebra - Hustle MA© National Convention 2011

The length of a rectangle is 1 less than three times its width. The perimeter of the rectangle is 46. Find the dimensions of the rectangle.

Answer : _____

Round 1 2 3 4 5

Round 1 2 3 4 5

Answer : _____

#11 Algebra - Hustle	
MA® National Convention 2011	

Find the solution set to the inequality $|4b-1| \le 5$, written in interval notation.

#11 Algebra - Hustle MA© National Convention 2011

Find the solution set to the inequality $|4b-1| \le 5$, written in interval notation.

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Answer	l .

Round 1 2 3 4 5

#11 Algebra - Hustle MA⊕ National Convention 2011

Find the solution set to the inequality $|4b-1| \le 5$, written in interval notation.

Answer : _____

Round 1 2 3 4 5

#11 Algebra - Hustle MA⊕ National Convention 2011

Find the solution set to the inequality $|4b-1| \le 5$, written in interval notation.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#12 Algebra - Hustle		
MA® National Convention	201 1	L

Evaluate the determinant: $\begin{vmatrix} 2 & 3 & 0 \\ 1 & -1 & 2 \\ 5 & 1 & 3 \end{vmatrix}$

#12 Algebra - Hustle MA⊖ National Convention 2011

Evaluate the determinant: $\begin{vmatrix} 2 & 3 & 0 \\ 1 & -1 & 2 \\ 5 & 1 & 3 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#12 Algebra - Hustle MA© National Convention 2011

Evaluate the determinant: $\begin{vmatrix} 2 & 3 & 0 \\ 1 & -1 & 2 \\ 5 & 1 & 3 \end{vmatrix}$

Answer : _____

Round 1 2 3 4 5

#12 Algebra – Hustle MA® National Convention 2011

Evaluate the determinant: $\begin{bmatrix} 2 & 3 & 0 \\ 1 & -1 & 2 \\ 5 & 1 & 3 \end{bmatrix}$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#13 Algebra - Hustle

MA® National Convention 2011

Find the ordered pair solution to the system:

$$\begin{vmatrix} x & y \\ -4 & 3 \end{vmatrix} = -10, \begin{vmatrix} x & 5 \\ y & 1 \end{vmatrix} = -16$$

#13 Algebra - Hustle

MA® National Convention 2011

Find the ordered pair solution to the system:

$$\begin{vmatrix} x & y \\ -4 & 3 \end{vmatrix} = -10, \begin{vmatrix} x & 5 \\ y & 1 \end{vmatrix} = -16$$

Answer : _____

Round 1 2 3 4 5

#13 Algebra - Hustle MA© National Convention 2011

Find the ordered pair solution to the system:

$$\begin{vmatrix} x & y \\ -4 & 3 \end{vmatrix} = -10, \begin{vmatrix} x & 5 \\ y & 1 \end{vmatrix} = -16$$

Answer : _____

Round 1 2 3 4 5

#13 Algebra - Hustle MA⊕ National Convention 2011

Find the ordered pair solution to the system:

$$\begin{vmatrix} x & y \\ -4 & 3 \end{vmatrix} = -10, \begin{vmatrix} x & 5 \\ y & 1 \end{vmatrix} = -16$$

Answer : _____

Answer : _____

#14 Algebra - Hustle		
MA® National Convention	201	1

Find the standard form of the parabola that passes through the points (1,4), (-1,6), and (0,2).

#14 Algebra - Hustle MA® National Convention 2011

Find the standard form of the parabola that passes through the points (1,4), (-1,6), and (0,2).

Answer : ______

Round 1 2 3 4 5

#14 Algebra - Hustle MA© National Convention 2011

Find the standard form of the parabola that passes through the points (1,4), (-1,6), and (0,2).

Answer : _____

Round 1 2 3 4 5

#14 Algebra - Hustle MA⊚ National Convention 2011

Find the standard form of the parabola that passes through the points (1,4), (-1,6), and (0,2).

Answer : _____

Answer : _____

Round 1 2 3 4 5

#15 Algebra - Hustle MA⊕ National Convention 2011

Find the quotient when $x^4 + x^3 - 7x^2 + 13x + 4$ is divided by $x^2 + 4x + 1$.

#15 Algebra - Hustle MA⊖ National Convention 2011

Find the quotient when $x^4 + x^3 - 7x^2 + 13x + 4$ is divided by $x^2 + 4x + 1$.

Answer : ______

Round 1 2 3 4 5

#15 Algebra - Hustle MA⊕ National Convention 2011

Find the quotient when $x^4 + x^3 - 7x^2 + 13x + 4$ is divided by $x^2 + 4x + 1$.

Answer : _____

Round 1 2 3 4 5

#15 Algebra - Hustle MA⊕ National Convention 2011

Find the quotient when $x^4 + x^3 - 7x^2 + 13x + 4$ is divided by $x^2 + 4x + 1$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#16 Algebra – Hustle MA© National Convention 2011

Joe had 14 liters of a 30% acid solution. How many liters of pure acid must be added to make a solution that is 80% acid?

#16 Algebra – Hustle MA© National Convention 2011

Joe had 14 liters of a 30% acid solution. How many liters of pure acid must be added to make a solution that is 80% acid?

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Answer:	1

Round 1 2 3 4 5

#16 Algebra - Hustle MA⊕ National Convention 2011

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Answer : _____

Round 1 2 3 4 5

#16 Algebra - Hustle MA⊕ National Convention 2011

Joe had 14 liters of a 30% acid solution. How many liters of pure acid must be added to make a solution that is 80% acid?

Answer : ______

Answer : _____

Round 1 2 3 4 5

#17 Algebra - Hustle MA⊕ National Convention 2011

Factor the expression:

$$(x-3)^2-2(x-3)(y+2)-35(y+2)^2$$

#17 Algebra - Hustle MA⊕ National Convention 2011

Factor the expression:

$$(x-3)^2-2(x-3)(y+2)-35(y+2)^2$$

Answer : _____

Round 1 2 3 4 5

#17 Algebra - Hustle MA® National Convention 2011

Factor the expression:

$$(x-3)^2-2(x-3)(y+2)-35(y+2)^2$$

Answer : _____

Round 1 2 3 4 5

#17 Algebra - Hustle MA© National Convention 2011

Factor the expression:

$$(x-3)^2-2(x-3)(y+2)-35(y+2)^2$$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle MA⊕ National Convention 2011

Solve the equation: $2^{y-1} = 2^y - 1$

#18 Algebra - Hustle MA⊕ National Convention 2011

Solve the equation: $2^{y-1} = 2^y - 1$

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle MA⊕ National Convention 2011

Solve the equation: $2^{y-1} = 2^y - 1$

Answer : _____

Round 1 2 3 4 5

#18 Algebra – Hustle MA⊕ National Convention 2011

Solve the equation: $2^{y-1} = 2^y - 1$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#19 Algebra - Hustle MA⊕ National Convention 2011

If f(x)=3x+4, what values of x satisfy the equation f(f(x))=f(x)?

#19 Algebra - Hustle MA⊖ National Convention 2011

If f(x)=3x+4, what values of x satisfy the equation f(f(x))=f(x)?

Answer : _____

Round 1 2 3 4 5

#19 Algebra - Hustle MA® National Convention 2011

If f(x)=3x+4, what values of x satisfy the equation f(f(x))=f(x)?

Answer : _____

Round 1 2 3 4 5

#19 Algebra - Hustle MA® National Convention 2011

If f(x)=3x+4, what values of x satisfy the equation f(f(x))=f(x)?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#20 Algebra – Hustle MA⊕ National Convention 2011

Write the fraction in lowest terms with a rationalized denominator: $\frac{1}{\sqrt{2} + \sqrt{3} + 1}$

#20 Algebra - Hustle MA⊕ National Convention 2011

Write the fraction in lowest terms with a rationalized denominator: $\frac{1}{\sqrt{2} + \sqrt{3} + 1}$

Answer	:	

Round 1 2 3 4 5

#20 Algebra - Hustle MA⊕ National Convention 2011

Write the fraction in lowest terms with a rationalized denominator: $\frac{1}{\sqrt{2} + \sqrt{3} + 1}$

Answer : _____

Round 1 2 3 4 5

#20 Algebra - Hustle MA⊕ National Convention 2011

Write the fraction in lowest terms with a rationalized denominator: $\frac{1}{\sqrt{2} + \sqrt{3} + 1}$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#21 Algebra - Hustle MA⊕ National Convention 2011

Solve the equation for real values of x: $(x-5)^2 - 4|x-5| - 12 = 0$

#21 Algebra - Hustle MA⊕ National Convention 2011

Solve the equation for real values of x:

$$(x-5)^2-4|x-5|-12=0$$

Answer : _____

Round 1 2 3 4 5

#21 Algebra - Hustle MA© National Convention 2011

Solve the equation for real values of x: $(x-5)^2 - 4|x-5| - 12 = 0$ Answer : _____

Round 1 2 3 4 5

#21 Algebra - Hustle MA® National Convention 2011

Solve the equation for real values of x: $(x-5)^2 - 4|x-5| - 12 = 0$

Answer : _____

Answer : _____

Round 1 2 3 4 5

#22 Algebra – Hustle MA⊖ National Convention 2011

A rectangle has width 6 and length 12. If both dimensions are increased by the same amount, the area enclosed by the rectangle is tripled. What is that amount?

#22 Algebra – Hustle MA© National Convention 2011

A rectangle has width 6 and length 12. If both dimensions are increased by the same amount, the area enclosed by the rectangle is tripled. What is that amount?

_	
Answer:	1

Round 1 2 3 4 5

#22 Algebra - Hustle MA® National Convention 2011

A rectangle has width 6 and length 12. If both dimensions are increased by the same amount, the area enclosed by the rectangle is tripled. What is that amount?

Answer:

Round 1 2 3 4 5

#22 Algebra - Hustle MA® National Convention 2011

A rectangle has width 6 and length 12. If both dimensions are increased by the same amount, the area enclosed by the rectangle is tripled. What is that amount?

Answer : _____

Answer : _____

Round 1 2 3 4 5

#23 Algebra - Hustle MA⊕ National Convention 2011

Find the area enclosed by the ellipse with equation $3x^2 + 4y^2 + 18x - 32y - 5 = 0$.

#23 Algebra - Hustle MA⊕ National Convention 2011

Find the area enclosed by the ellipse with equation $3x^2 + 4y^2 + 18x - 32y - 5 = 0$.

Answer : ______

Round 1 2 3 4 5

#23 Algebra – Hustle MA© National Convention 2011

Find the area enclosed by the ellipse with equation $3x^2 + 4y^2 + 18x - 32y - 5 = 0$.

Answer : ______

Round 1 2 3 4 5

#23 Algebra – Hustle MA© National Convention 2011

Find the area enclosed by the ellipse with equation $3x^2 + 4y^2 + 18x - 32y - 5 = 0$.

Answer : _____

Answer : _____

Round 1 2 3 4 5

#24 Algebra – Hustle MA⊕ National Convention 2011

Find the solutions of the system:

$$\begin{cases} x^2 + 4y^2 = 16 \\ x + 2y = -4 \end{cases}$$

#24 Algebra - Hustle MA⊕ National Convention 2011

Find the solutions of the system:

$$\begin{cases} x^2 + 4y^2 = 16 \\ x + 2y = -4 \end{cases}$$

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Answer:		
Allowel .		

Round 1 2 3 4 5

#24 Algebra – Hustle MA© National Convention 2011

Find the solutions of the system:

$$\begin{cases} x^2 + 4y^2 = 16 \\ x + 2y = -4 \end{cases}$$

Answer : _____

Round 1 2 3 4 5

#24 Algebra - Hustle MA® National Convention 2011

Find the solutions of the system:

$$\begin{cases} x^2 + 4y^2 = 16 \\ x + 2y = -4 \end{cases}$$

Answer : _____

Round 1 2 3 4 5

Answer : _____

#25 Algebra – Hustle MA⊖ National Convention 2011

#25 Algebra – Hustle MA⊕ National Convention 2011

Solve the equation: $\log x + 2 = \log(x+2)$

Solve the equation: $\log x + 2 = \log(x+2)$

Answer : _____

Round 1 2 3 4 5

#25 Algebra - Hustle MA⊕ National Convention 2011

Solve the equation: $\log x + 2 = \log(x+2)$

Answer : _____

Round 1 2 3 4 5

#25 Algebra - Hustle MA⊚ National Convention 2011

Solve the equation: $\log x + 2 = \log(x+2)$

Answer : _____

Answer : _____

Round 1 2 3 4 5