

#1 Algebra II – Hustle
FAMAT State Convention 2008

What is the greatest x-intercept for
 $y = 6x^2 + x - 2$?
Express the answer in simplified
fraction form.

Answer: _____

Round 1 2 3 4 5

#3 Algebra II – Hustle
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For $A(x,4)$ and $B(-1,1)$, the slope
of \overline{AB} is $\frac{3}{4}$ and $AB = 5$. What is
the value of x ?

Answer: _____

Round 1 2 3 4 5

#2 Algebra II – Hustle
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Let x be an integer. What is the solution
to the compound inequality below?

$$|3x - 4| = |2x + 1| \text{ and } x^2 > 3x + 4$$

Answer: _____

Round 1 2 3 4 5

#4 Algebra II – Hustle
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For $P(-3,-2)$ and $Q(3,1)$, what is the
x-coordinate of the trisection point
closest to Q ?

Answer: _____

Round 1 2 3 4 5

#5 Algebra II – Hustle
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What is the minimum value of
 $f(x) = 3x^2 - 18x + 5$?

Answer: _____

Round 1 2 3 4 5

#7 Algebra II – Hustle
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Let $A = \{\text{prime numbers less than } 20\}$
Let $B = \{\text{odd numbers between } 0 \text{ and } 20\}$

How many elements belong to A and B ?

Answer: _____

Round 1 2 3 4 5

#6 Algebra II – Hustle
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A line passes through the points $(-6, -2)$
and $(3, 4)$. What is the product of its
x-intercept and its y-intercept?

Answer: _____

Round 1 2 3 4 5

#8 Algebra II – Hustle
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Let $f(x) = x^2 - 4x + 2$ and $g(x) = 2x - 4$.

What is the value of $\frac{(f \circ g)(3)}{g^{-1}(1)}$?

Express the answer in simplified
fraction form.

Answer: _____

Round 1 2 3 4 5

#9 Algebra II – Hustle
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What is the solution to the equation below?

$$\sqrt{x-1} = x-3$$

Answer: _____

Round 1 2 3 4 5

#11 Algebra II – Hustle
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What is the value of the expression below in standard form?

$$\frac{(1.2 \times 10^5)(3 \times 10^{-4})}{1.8 \times 10^{-3}}$$

Answer: _____

Round 1 2 3 4 5

#10 Algebra II – Hustle
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In the problem below, the subscripts denote number bases. What goes in the box below?

$$121_{FOUR} = \boxed{}_{THREE}$$

Answer: _____

Round 1 2 3 4 5

#12 Algebra II – Hustle
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How many subsets of $\{1,2,3,4,\dots,9\}$ contain 3 elements?

Answer: _____

Round 1 2 3 4 5

#13 Algebra II – Hustle
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Eight runners are participating in a race with awards for 1st, 2nd, and 3rd place. In how many ways can the awards be given if there are no ties?

Answer: _____

Round 1 2 3 4 5

#15 Algebra II – Hustle
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If $i = \sqrt{-1}$, what is the value of $i^{102}|3-4i|$?

Answer: _____

Round 1 2 3 4 5

#14 Algebra II – Hustle
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If $(3x^2 - y)^8$ were expanded, what would be the coefficient of the term that contained x^4 ?

Answer: _____

Round 1 2 3 4 5

#16 Algebra II – Hustle
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What is the least zero of $f(x) = x^4 - 2x^3 - x^2 + 2x$?

Answer: _____

Round 1 2 3 4 5

#17 Algebra II – Hustle
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If $\begin{bmatrix} 2 & 3 \\ 3 & -2 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} -4 \\ 7 \end{bmatrix}$, what is the value of $x - 2y$?

Answer: _____

Round 1 2 3 4 5

#19 Algebra II – Hustle
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If $3^{-2x} = 4$, what is the value of 9^{3x} ?
Express the answer in simplified fraction form.

Answer: _____

Round 1 2 3 4 5

#18 Algebra II – Hustle
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If $x < 0$, what is the value of y for the given system below?

$$\begin{cases} x^2 + x + y^2 - 3y + 2 = 0 \\ x + 1 + \frac{y^2 - y}{x} = 0 \end{cases}$$

Answer: _____

Round 1 2 3 4 5

#20 Algebra II – Hustle
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What is the value of $(\log_2 2) \cdot (\log_2 4) \cdot (\log_2 8) \cdot \dots \cdot (\log_2 64)$?

Answer: _____

Round 1 2 3 4 5

#21 Algebra II – Hustle
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What is the product of the solutions
to the equation $\frac{3}{4}x^2 - \frac{1}{4}x - \frac{1}{2} = 0$?

Express the answer as a simplified fraction.

Answer: _____

Round 1 2 3 4 5

#23 Algebra II – Hustle
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A football team has a 70% chance of winning when it doesn't snow, but only a 40% chance of winning when it snows. Suppose there is a 50% chance of snow. What is the probability that the team will win? Express the answer as a decimal.

Answer: _____

Round 1 2 3 4 5

#22 Algebra II – Hustle
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What is $\left(\frac{27}{8}\right)^{\frac{2}{3}} \left(\frac{16}{9}\right)^{-\frac{3}{2}}$? Express
the answer as a simplified fraction.

Answer: _____

Round 1 2 3 4 5

#24 Algebra II – Hustle
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What is the 30th term of -14, -9, -4, ...?

Answer: _____

Round 1 2 3 4 5

#25 Algebra II – Hustle
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What is $\sum_{n=1}^{\infty} 2\left(\frac{2}{3}\right)^{n-1}$?

Answer: _____

Round 1 2 3 4 5

