#1 Algebra II – Hustle
National MAΘ 2008

Simplify:

$$(3i)^2(-2i) + (4i^3)(-2i^2) + \left(\frac{3}{i}\right)\left(\frac{-2}{i^2}\right)$$

Answer : _____

Round   1   2   3   4   5

#2 Algebra II – Hustle
National MAΘ 2008

Find the value of:
$_8C_3 - _6C_2 - _5C_2$

Answer : _____

Round   1   2   3   4   5

#2 Algebra II – Hustle
National MAΘ 2008

Find the value of:
$_8C_3 - _6C_2 - _5C_2$

Answer : _____

Round   1   2   3   4   5

#2 Algebra II – Hustle
National MAΘ 2008

Find the value of:
$_8C_3 - _6C_2 - _5C_2$

Answer : _____

Round   1   2   3   4   5

#2 Algebra II – Hustle
National MAΘ 2008

Find the value of:
$_8C_3 - _6C_2 - _5C_2$

Answer : _____

Round   1   2   3   4   5

#3 Algebra II – Hustle
National MAΘ 2008

Find the sum of the roots of
$3^{5x} \bullet 9^{x^2} = 27$

Answer : _____

Round   1   2   3   4   5

#4 Algebra II – Hustle
National MAΘ 2008

Simplify:

$$\frac{2^{n+3} + 2\left(2^n\right)}{2\left(2^{n+4}\right)}$$

Answer : _____

Round   1   2   3   4   5

Under proper restrictions,
$\log 2a = x$ **and** $\log 2B = y$**.**

If $\dfrac{x + y}{x - y} = 1,$ **solve for** B**.**

Answer : _____

Round   1   2   3   4   5

#5 Algebra II – Hustle
National MAΘ 2008

Under proper restrictions,
$\log 2a = x$ **and** $\log 2B = y$**.**

If $\dfrac{x + y}{x - y} = 1,$ **solve for** B**.**

Answer : _____

Round   1   2   3   4   5

#5 Algebra II – Hustle

#6 Algebra II – Hustle

National MAΘ 2008

Determine the focus of
$y = -3x^2 + 7x - 5$

Answer : _____

Round   1   2   3   4   5

National MAΘ 2008

Determine the focus of
$y = -3x^2 + 7x - 5$

Answer : _____

Round   1   2   3   4   5

#6 Algebra II – Hustle
National MAΘ 2008

Determine the focus of
$y = -3x^2 + 7x - 5$

Answer : _____

Round   1   2   3   4   5

#6 Algebra II – Hustle

#6 Algebra II – Hustle
National MAΘ 2008

Determine the focus of
$y = -3x^2 + 7x - 5$

Answer : _____

Round   1   2   3   4   5

#7 Algebra II – Hustle

National MAΘ 2008

Solve over the Reals:
$x^3 + x^2 - 2x \leq 0$
Give answer in interval notation.

Answer : _____

Round   1   2   3   4   5

#7 Algebra II – Hustle
National MAΘ 2008

Solve over the Reals:
$x^3 + x^2 - 2x \leq 0$
Give answer in interval notation.

Answer : _____

Round   1   2   3   4   5

#7 Algebra II – Hustle

#8 Algebra II – Hustle
National MAΘ 2008

Let $\log 2 = a, \log 3 = b$**. Give an expression**
for the simplified form of $\log 50$**.**

Answer : _____

Round   1   2   3   4   5

#9 Algebra II – Hustle
National MAΘ 2008

The sum of the first 6 terms of a geometric
progression is nine times the sum of the
first three terms. Find the common ratio.

Answer : _____

Round   1   2   3   4   5

#10 Algebra II – Hustle
National MAΘ 2008

Find the value of $x + y$ when
$$\frac{x+3}{2} + \frac{y-1}{3} = 5 \text{ and}$$
$$\frac{x+y}{3} - \frac{2y-3}{5} = 2.$$

Answer : _____

Round   1   2   3   4   5

#11 Algebra II – Hustle
National MAΘ 2008

If $x - 2(1 - 3x) = 6 + 3(4 - x)$ and
$\dfrac{3y+1}{3y-1} = \dfrac{2y+1}{2y-3}$, then find the value
of $4x - 3y$.

Answer : _____

Round   1   2   3   4   5

#12 Algebra II – Hustle
National MAΘ 2008

Give the simplified form of $\dfrac{1-\sqrt{3}}{5+2\sqrt{3}}$

Answer : _____

Round   1   2   3   4   5

#13 Algebra II – Hustle
National MAΘ 2008

Find the value of *x*:
$\log[\log_2 (\log_x 25)] = 0.$

Answer : _____

Round   1   2   3   4   5

#14 Algebra II – Hustle
National MAΘ 2008

Find the sum $\dfrac{21}{x^2 - 49} + \dfrac{3}{x + 7}$

Express the answer in simplest form.

Answer : _____

Round   1   2   3   4   5

#15 Algebra II – Hustle
National MAΘ 2008

Solve the inequality $\frac{1}{2}(12-5m)-\frac{7}{2}m<18$.

Give your solution in interval notation.

Answer : _____

Round   1   2   3   4   5

#16 Algebra II – Hustle
National MAΘ 2008

Simplify $e^{\ln 18 + \ln 9}$

Answer : _____

Round   1   2   3   4   5

#17 Algebra II – Hustle
National MAΘ 2008

Simplify: $\sqrt[3]{\sqrt[4]{5} \bullet \sqrt[4]{25}}$

Answer : _____

Round   1   2   3   4   5

#18 Algebra II – Hustle
National MAΘ 2008

Solve over the reals: $\begin{aligned} y^2 - 4x^2 &= 16 \\ 2x^2 + y^2 &= 16 \end{aligned}$

Express your answer(s) as an ordered pair(s).

Answer : _____

Round   1   2   3   4   5

#19 Algebra II – Hustle
National MAΘ 2008

Evaluate $\begin{vmatrix} 3 & 0 & 0 \\ 0 & 0 & -2 \\ 0 & -4 & 1 \end{vmatrix}$

Answer : _____

Round   1   2   3   4   5

#20 Algebra II – Hustle

National MAΘ 2008

If z varies directly as x^2 and inversely as y, and $z = \dfrac{3}{4}$ when $x = 9$ and $y = 2$, find the value of z when $x = 12$ and $y = \dfrac{1}{2}$.

Answer : _____

Round   1   2   3   4   5

#20 Algebra II – Hustle
National MAΘ 2008

If z varies directly as x^2 and inversely as y, and $z = \dfrac{3}{4}$ when $x = 9$ and $y = 2$, find the value of z when $x = 12$ and $y = \dfrac{1}{2}$.

Answer : _____

Round   1   2   3   4   5
#20 Algebra II – Hustle

#21 Algebra II – Hustle

National MAΘ 2008

Find the quadratic **equation** having $2 \pm \sqrt{3}$ as roots.

Answer : _____

Round   1   2   3   4   5

#21 Algebra II – Hustle
National MAΘ 2008

Find the quadratic **equation** having $2 \pm \sqrt{3}$ as roots.

Answer : _____

Round   1   2   3   4   5

#21 Algebra II – Hustle

#22 Algebra II – Hustle

National MAΘ 2008

Find **all** roots of $x^3 - 3x + 52 = 0$ given that one root is $2 - 3i$.

Answer : _____

Round   1   2   3   4   5

#22 Algebra II – Hustle
National MAΘ 2008

Find **all** roots of $x^3 - 3x + 52 = 0$ given that one root is $2 - 3i$.

Answer : _____

Round   1   2   3   4   5

#22 Algebra II – Hustle

#23 Algebra II – Hustle
National MAΘ 2008

Find a_2 for the geometric sequence with $a_3 = 243$ and $a_7 = 3$.

Answer : _____

Round   1   2   3   4   5

#24 Algebra II – Hustle
National ΜΑΘ 2008

Determine an equation of the parabola having

focus $\left(\dfrac{7}{8}, 3\right)$ and directrix $x = \dfrac{9}{8}$.

Answer : _____

Round   1   2   3   4   5

#25 Algebra II – Hustle
National MAΘ 2008

Solve $\sqrt{x-4} + x = 6$

Answer : _____

Round   1   2   3   4   5