Question # 1

Algebra I Team Round

Florida Blue Key Invitational 2008

$f(x) = x + 1 \quad g(y) = 2y$ and $h(z) = 3z^2 + z - 18$

$A = f(-10) + f(-9) + f(-8) + ... + f(9) + f(10)$

$B = g(-3) + g(-1) + g(1) + g(3) + g(5)$

$C = h(753)$

Find the value of C^{A-2B-1}

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Algebra I Team Round

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Question # 2

Algebra I Team Round

Florida Blue Key Invitational 2008

$f(x) = x^2 + 3x - 4 \quad g(x) = x - 1 \quad h(x) = 3x - 3$

Let A be the x-coordinate of the intersection of $g(x)$ and $h(x)$.

Let B be the distance between the points where $f(x)$ and $g(x)$ intersect.

Let C be the sum of the y-coordinates where $f(x)$ and $h(x)$ intersect.

Find $A + B^2 + C$

Question # 2

Algebra I Team Round

Florida Blue Key Invitational 2008

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Find $A + B^2 + C$

Question # 3

Algebra I Team Round

Florida Blue Key Invitational 2008

Find the sum of the solutions to the following problems.

I) If $|x + 1| + |x - 1| = 3$, find the sum of the value(s) of x.

II) The sum of the solutions for x: $x^2 - 19x - 3 = 0$.

III) Find the distance between the points (1,1) and (9, -5).

Question # 3

Algebra I Team Round

Florida Blue Key Invitational 2008

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III) Find the distance between the points (1,1) and (9, -5).

Question # 4

Algebra I Team Round

Florida Blue Key Invitational 2008

$f(x)$ and $g(x)$ are linear functions such that $g(x)$ is the inverse of $f(x)$. We are told that $f(8) = 1$ and $f(3) = -9$.

Find the value of $f(1) + 2g(\pi) - f(g(\pi))$

Question # 4

Algebra I Team Round

Florida Blue Key Invitational 2008

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Question # 5

Algebra I Team Round

Florida Blue Key Invitational 2008

Lauren and Roland are on a camping trip. They are visiting their favorite lake. It takes them 2 hours to row 100 units upstream from their camping site to the end of the river in the canoe that Roland brought. The return trip takes 45 minutes. Back at the camping site, Lauren with her amazing math skills was quickly able to correctly calculate the magnitude of the river's current. What was the number that Lauren's calculations yielded?

Question # 5

Algebra I Team Round

Florida Blue Key Invitational 2008

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Question # 6

Algebra I Team Round

Florida Blue Key Invitational 2008

The equation $f(x) = x^2 + 7x - 8$ has two real roots, r_1 and r_2. $g(x)$ is a quadratic polynomial with integer coefficients and whose coefficient of x^2 is 1. The coefficients of $g(x)$ are chosen such that $g(s_1) = g(s_2) = 0$, where $s_1 = r_1 + \alpha$, $s_2 = r_2 + \alpha$, and α is an integer. Find the sum of the coefficients of $g(x)$ in terms of α.

Question # 6

Algebra I Team Round

Florida Blue Key Invitational 2008

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Question # 7

Algebra I Team Round

Florida Blue Key Invitational 2008

Triangle ABC is drawn so that the coordinates of A, B, and C are (6, 8), (-5, -12), and (-1, 4) respectively. The centroid of this triangle is the origin. Let *a, b,* and *c* be the distances from the centroid to A, B, and C respectively.

Find the value of $a + b + c$.

Question # 7

Algebra I Team Round

Florida Blue Key Invitational 2008

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Find the value of $a + b + c$.

Question # 8

Algebra I Team Round

Florida Blue Key Invitational 2008

A = The denominator when the decimal $.63\overline{4}$ is written as a fraction in lowest terms.

B = The value of $\frac{6+4\sqrt{2}}{3+2\sqrt{2}}$.

C = The product of the factors of 30.

Find $\frac{C}{AB}$.

Question # 8

Algebra I Team Round

Florida Blue Key Invitational 2008

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Question # 9

Algebra I Team Round

Florida Blue Key Invitational 2008

Find the sum of the coefficients in the expansion of $(3x + 2y + z)^3$.

Question # 9

Algebra I Team Round

Florida Blue Key Invitational 2008

Find the sum of the coefficients in the expansion of $(3x + 2y + z)^3$.

Question # 10

Algebra I Team Round

Florida Blue Key Invitational 2008

A = $\dfrac{4\sqrt{50}-3\sqrt{98}+2\sqrt{18}}{2\sqrt{32}+5\sqrt{2}-4\sqrt{72}}$ (Simplify.)

B = The least common multiple of $6x^2y^3z$ and $3xy^2z^4$.

C = The greatest common factor of $6x^2y^3z$ and $3xy^2z^4$.

Find the value of $\dfrac{AB}{C}$

Question # 10

Algebra I Team Round

Florida Blue Key Invitational 2008

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B = The least common multiple of $6x^2y^3z$ and $3xy^2z^4$.

C = The greatest common factor of $6x^2y^3z$ and $3xy^2z^4$.

Find the value of $\dfrac{AB}{C}$

Question # 11

Algebra I Team Round

Florida Blue Key Invitational 2008

A = The units digit of 2006^{2008}

B = The units digit of 2008^{2008}

C = The value of $x^2 + xy + y^2$ if $(x+y)^2 = 100$ and $(x-y)^2 = 36$

Find the units digit of $(A + B)^C$

Question # 11

Algebra I Team Round

Florida Blue Key Invitational 2008

A = The units digit of 2006^{2008}

B = The units digit of 2008^{2008}

C = The value of $x^2 + xy + y^2$ if $(x+y)^2 = 100$ and $(x-y)^2 = 36$

Find the units digit of $(A + B)^C$

Question # 12

Algebra I Team Round

Florida Blue Key Invitational 2008

Let $a \otimes b = \dfrac{a^2 + ab + b^2}{|a - b|}$. Find the value of $(2 \otimes 3) \otimes (4 \otimes 5)$.

Question # 12

Algebra I Team Round

Florida Blue Key Invitational 2008

Let $a \otimes b = \dfrac{a^2 + ab + b^2}{|a - b|}$. Find the value of $(2 \otimes 3) \otimes (4 \otimes 5)$.

Question # 13

Algebra I Team Round

Florida Blue Key Invitational 2008

Find the sum of the squares of the prime factors of 2008.

Question # 13

Algebra I Team Round

Florida Blue Key Invitational 2008

Find the sum of the squares of the prime factors of 2008.

Question # 14

Algebra I Team Round

Florida Blue Key Invitational 2008

When the repeating decimal $.24\overline{6}$ is written as an improper fraction in simplest form, what is the sum of the numerator and denominator?

Question # 14

Algebra I Team Round

Florida Blue Key Invitational 2008

When the repeating decimal $.24\overline{6}$ is written as an improper fraction in simplest form, what is the sum of the numerator and denominator?

Question # 15

Algebra I Team Round

Florida Blue Key Invitational 2008

What is the remainder when $35x^2 - 51x + 16$ is divided by $7x - 6$?

Question # 15

Algebra I Team Round

Florida Blue Key Invitational 2008

What is the remainder when $35x^2 - 51x + 16$ is divided by $7x - 6$?