# Question # 1

**Algebra I Team Round**
**Eastside Statewide March 2011**

Let:

$A = 1 + 2 + 3 + 4 + \ldots + 100$

$B = 1 + 3 + 5 + 7 + \ldots + 99$

$C = 2 + 4 + 6 + \ldots + 100$

Find the value of $B + C - A$

# Question # 2

**Algebra I Team Round**
**Eastside Statewide March 2011**

$A + 3 = 5$

$AB = 10$

$B^C = 25$

Find $A + B + C$

# Question # 3

**Algebra I Team Round**
**Eastside Statewide March 2011**

Josh can do a job in 5 hours and Joe can do the same job in 10 hours. How long will it take Josh and Joe to do 5 jobs, if they are working together? All jobs take the same amount of time, and Josh and Joe work at constant rates.

Give your answer in hours.

# Question # 4

**Algebra I Team Round**
**Eastside Statewide March 2011**

If $f(x) = 3x^2 + 2x - 1$ and $g(x) = 3x + 1$,

Let $A = f(4)$ $B = g(2)$ $C = g(1)$ $D = f(8)$

Find the value of $A + B + C + D$

# Question # 5

**Algebra I Team Round**
**Eastside Statewide March 2011**

What is the sum of the 5 largest prime numbers less than 100?

# Question # 6

**Algebra I Team Round**
**Eastside Statewide March 2011**

$A @ B = A - B + B^A$
$E \& F = (E + F)(E - F)$

Find $((2 @ 1) \& (3 @ 2)) \& ((3 @ 1) \& (1 @ 4))$.

# Question # 7

**Algebra I Team Round**
**Eastside Statewide March 2011**

Let $f(x) = 3x^2 + 2x - 1$.

A = the sum of the roots

B = the sum of the squares of the roots

C = the sum of the reciprocals of the roots

D = the product of the roots

Find A + B + C + D

# Question # 8

**Algebra I Team Round**
**Eastside Statewide March 2011**

What is the equation of the perpendicular bisector of the line segment between points (3,4) and (5,1)?

Express your answer in the form $ax + by = c$, where a, b, and c are all relatively prime integers and $a > 0$.

# Question # 9

**Algebra I Team Round**
**Eastside Statewide March 2011**

$x + 3y = 11$ and $x + y = 5$ intersect at the point (a, b).

$x + y = 4$ and $3x + y = 10$ intersect at the point (c, d).

$x – y = -3$ and $3x – 2y = -5$ intersect at the point (e, f).

$x + y = 2$ and $x – y = 0$ intersect at the point (g, h).

Find the value of $a + b + c + d + e + f + g + h$.

# Question # 10

**Algebra I Team Round**
**Eastside Statewide March 2011**

Express the following with only positive exponents:

$$(3x^2 4y^2)^{-3}(2zy)^4(x^2yz^3)^{-2}$$

# Question # 11

**Algebra I Team Round**
**Eastside Statewide March 2011**

A number is perfect if its proper positive integral factors add up to the number itself.
For instance, 496 is the 3rd perfect number.

A = first perfect number

B = second perfect number

Find A + B

# Question # 12

**Algebra I Team Round**
**Eastside Statewide March 2011**

Let $f(x) = 3x^2 + 2x - 1$. At what value(s) of x does $f(x) = 0$?

# Question # 13

**Algebra I Team Round**
**Eastside Statewide March 2011**

10% of 50% of a number is equal to 20. What is the number?

# Question # 14

**Algebra I Team Round**
**Eastside Statewide March 2011**

The lines $3x + 4y = 7$ and $2x + 5y = 7$ intersect at point (a, b).

The lines $4x – y = 7$ and $3y – 2x = -1$ intersect at point (c, d).

Find the value of abcd.

# Question # 15

**Algebra I Team Round**
**Eastside Statewide March 2011**

How many of the following are divisible by 11?

113010303013
13012932
94038409
29392
4929
2939
11
3292