2015 Washington State Math Championship

$$B > \frac{1}{n}\sum_{i=1}^{n} x_i$$

(Be greater than average)

Algebra – 7th Grade

1. **2 points:** At the student store, protractors are being sold for \$3 each and calculators for \$8 each. On the day of the final semester exam, 35 items are sold, totaling in \$160 of sales. How many protractors were sold?

2. **2 points:** If you ride your bike at an average speed of 20 miles per hour for 45 minutes, and then run at an average speed of 6 miles per hour for 30 minutes, what was your average overall speed in miles per hour? **Express your answer as a decimal.**

3. **2 points:** Moe and Curly are driving directly towards each other at distinct constant speeds, initially 1000 yards apart. If Moe is driving at 30 miles per hour and Curly is driving 45 miles per hour, how many yards will Curly have traveled when they finally crash into each other?

4. **3 points:** What is the positive difference between the sum of the first 50 positive odd integers and the sum of the first 49 positive even integers?

5. **3 points:** The difference between a number cubed and 9 times that number is 0. What is the greatest possible value of that number?

6. **3 points:** Suppose that \$1 is put into each of 50 boxes sitting on a table. The first person goes through and doubles the current amount in every other box. The second person goes through and doubles the current amount in every third box. Finally, the third person goes through and triples the current amount in every tenth box. If you were to collect all the money from all 50 boxes, how many dollars would you have?

7. **3 points:** In order to rent a bus for an exciting field trip to "The Pi Factory", 28 kids each had to pay an equal amount to cover the cost. If 7 more kids would have gone, each of the 28 kids would have had to pay \$5 less. How much money, in dollars, does it cost to rent the bus?

8. **4 points:** The sum of three consecutive positive odd integers, the first of which is the mystery number, is equal to the product of two more than the mystery number and two less than the mystery number. What is the mystery number?

9. **4 points:** The graphs of $y = x^2 - 3x + 4$ and $y = -2x^2 + 6x + 4$ intersect at the points (a, b) and (c, d). What is the value of $a + b + c + d$?

10. **4 points:** The line passing through the points $(g, 3)$ and $(h, 7)$ has a slope of $\frac{2}{3}$. A line that passes through the points $(h, 6)$ and $(2, h)$ has a slope of $-\frac{1}{2}$. What is the sum of g and h?