

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

(Be greater than average)

Algebra – 8<sup>th</sup> Grade

- 2 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?
- 2 points:** The difference between a number cubed and 9 times that number is 0. What is the greatest possible value of that number?
- 2 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?
- 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?
- 3 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?
- 3 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  $a + b + c + d$ ?
- 3 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  $h$ ?
- 4 points:** What value of  $x$  satisfies  $\frac{8^{3x+2}}{4^{2x}} = 1024$ ? **Express your answer as an reduced fraction.**
- 4 points:** For how many integer values of  $x$  does  $\frac{12+x}{x}$  have an integral value?
- 4 points:** What is the coefficient of the  $x^2$  term when  $(2x + 3)^4$  is expanded?