



Washington State
Math Championship

ConocoPhillips
Ferndale Refinery

Blaine School
District

Probability and Statistics

6th Grade

Bubble in your answers on the answer sheet. Be sure to erase all mistakes completely. You do not need to bubble in leading zeros – the answer of “7” does not need to be answered as “007”. If your answer is a fraction like $\frac{3}{16}$, bubble in 316.

- 2 points:** At the end of the year, during which there were 10 grueling mathematics tests, Grisham's average score was 70%. When looking at his final test though, he noticed there was a grading error which would raise that test's score from the original score of 40% to a new score of 70%. If all ten tests are weighted equally, what is his new average score for the year? **Express your answer as a percent.**
- 2 points:** A mathematician wants to create a four-digit password for his computer using three rules:
 - The first and last digits must be prime numbers.
 - The second digit must be odd.
 - The third digit can be any digit but cannot be a repeat of the second digit.How many unique passwords are possible?
- 2 points:** Suppose that eight students' scores on a 100-point test are: 20, 44, 75, 70, 100, 88, 95, and 68. What is the probability that a randomly selected student will have scored below the class average? **Express your answer as a reduced fraction.**
- 3 points:** The principal at Einstein High had seen all sorts of colorful rubber bands lying on the grounds, so she decided to find out how many of the 100 students were playing with two of the most popular toys. She found that 42 students played with Tech Decks, 25 played with Silly Bandz, and 22 played with both. How many students played with neither the Tech Decks nor Silly Bandz?
- 3 points:** How many ways are there to select a student body president, vice-president, and treasurer from a group of eight candidates?
- 3 points:** In the board game *Monopoly*, you roll two dice to determine the number of spaces you move. If you roll “doubles”, that is, the same number on each die, you get an extra turn. Assuming you are rolling two fair six-sided dice, what is the probability of rolling doubles on any given turn? **Express your answer as a reduced fraction.**
- 3 points:** Suppose that two positive integers less than or equal to 1000 are selected randomly and with replacement. What is probability that the product of those two integers will be odd? **Express your answer as a reduced fraction.**



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8. **4 points:** Suppose that two brothers, Edward and Carlos, had a coin flip-off to see who would do the evening chores. Whoever flipped the least heads after three flips would have to do the chores. If they tied, they would share the work. However, Edward didn't realize that he had a weighted coin that landed on heads 30% of the time. If Carlos flipped three heads, what is the probability that Edward would have to do the chores by himself? **Express your answer to the nearest whole percent.**

9. **4 points:** If six fair coins are flipped, what is the probability that more than half of the coins will land on heads? **Express your answer to the nearest whole percent.**

10. **4 points:** How many unique arrangements are possible with the letters in the word "BIEBER"?