

Part 1. Multiple Choice (15)

1. Samantha is choosing an outfit to wear to the dance. She has 3 different tops, 4 different pants and 2 different pairs of shoes to choose from. How many different outfits could she make from this selection of clothes? 1.____
 A) 9 B) 12 C) 14 D) 24

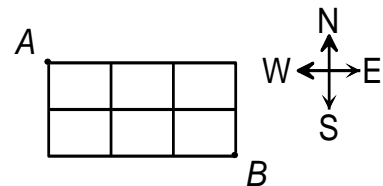
2. Simplify: $\frac{8!}{2!5!}$ 2.____
 A) 0.0111 B) 168 C) 336 D) 2,419,200

3. Consider the word CAT. In how many different ways can the letters be arranged? 3.____
 A) 1 B) 3 C) 4 D) 6

4. Simplify: $\frac{(n+2)!}{n!}$ 4.____
 A) $\frac{1}{n^2+3n+2}$ B) $2!$ C) $2n+3$ D) n^2+3n+2

5. What restriction must be applied to the variable in #4 above? 5.____
 A) $n \geq -2$ B) $n > -2$ C) $n \geq 0$ D) $n > 0$

6. In the grid below, a person must travel from *A* to *B* by only heading East (E) or South (S). Under these rules, which represents the total number of possible routes that can be taken to get from *A* to *B*? 6.____
 A) $\frac{5!}{3!2!}$ B) $\frac{6!}{3!2!}$
 C) $5!$ D) $6!$



Part 2. Answer all questions in the space provided. Show all workings! (20)

16. Six different scholarships will be awarded at the graduation ceremonies in November. If the graduating class has 30 students determine the number of ways to award the scholarships if,

A) there are no conditions on who can win the scholarships

(2)

B) no student can win more than one scholarship

(2)

C) Clara must be awarded the "Most Improved Student" scholarship and Craig must receive the scholarship for highest average.

(2)

17. Four students are to be chosen from a group of 10 to fill the positions of president, vice-president, treasurer and secretary. In how many ways can this be accomplished?

(2)

18. Algebraically solve for n and verify your answer: ${}_nP_2 = 12$

(4)

19. A group of five Art club students are to be selected for a field trip to the Rooms. If there are 5 boys and 6 girls in the club, how many ways can the leader select the five students if there must be at most 2 boys?

(4)

20. You need to create a password that must be at least 4 characters but no more than 6 characters long. The password may contain lower case letters as well as the digits 1 to 9. No repeated characters are allowed. How many different passwords are possible?

(4)