MATH 104 FUNDAMENTALS II SUMMER 2008 WORKSHEET IIA NAME:_____
(please print legibly)

Show all work. If an answer DNE, explain why it does not exist.

1. Compute $7!$

2. Compute $P_{7,3}$

3. Compute $P(7, 3)$

4. Compute $\binom{17}{15}$

5. Compute $P(7, 4)$

6. Compute $C(7, 4)$

7. Compute $C(17, 3)$

8. Compute $C(17, 14)$

9. Compute $C_4^7$

10. Compute $\binom{2}{3}$

11. Compute $\binom{11}{6} - \binom{9}{4}$

12. Compute $\binom{11}{6} \cdot \binom{5}{5}$

13. Compute $\binom{11}{6} \cdot \binom{7}{5} \cdot \binom{12}{7}$

14. Compute $P_{18}^{17}$

15. Six boys and eleven girls are in a club. Suppose an election is to be held such that a boy will be chosen president, then a girl vice president, then a girl as secretary. How many ways can this be done?

16. Six boys and eleven girls are in a club. Suppose an election is to be held such that two boys and three girls will be chosen for a committee. How many ways can this be done?

17. Six boys and eleven girls are in a club. Suppose an election is to be held such that five of these kids will be chosen for a committee. How many ways can this be done?

18. Six boys and eleven girls are in a club. Suppose an election is to be held such that a girl will be chosen president, then a girl vice president, then a girl as secretary. How many ways can this be done?

19. A fair coin is to be flipped five times. How many unique sequences of heads / tails are there?

20. A fair coin is to be flipped five times. How many ways are there to get exactly three of the flips to be heads?

21. A fair coin is to be flipped five times. How many ways are there to get at least three of the flips to be heads?

22. Compute $8!$
23. Compute $8! - 6!$
24. Compute $(8 - 6)!$
25. Compute $6! - 8!$
26. Compute $(6 - 8)!$

Note all of the following are true:

27. Claim: Let $n \in \mathbb{N}^*$ $\binom{n}{0} = 1$

28. Claim: Let $n \in \mathbb{N}^*$ $\binom{n}{1} = n$

29. Claim: Let $n \in \mathbb{N}$ $\binom{n}{n-1} = n$

30. Claim: Let $n \in \mathbb{N}^*$ $\binom{n}{n} = 1$

31. Claim: Let $n \in \mathbb{N}$ Let $k \in \mathbb{N}$ where $k \leq n$ $\binom{n}{k} = \binom{n-1}{k-1} + \binom{n-1}{k}$

32. Claim: Let $n \in \mathbb{N}$ Let $k \in \mathbb{N}$ where $k < n$ $\binom{n}{k} = \binom{n-1}{k-1} + \binom{n-1}{k}$

33. Claim: Let $n \in \mathbb{N}$ Let $k \in \mathbb{N}$ where $k \leq n$ $\binom{n}{k} = \binom{n}{n-k}$