100/223 Counting Practice

1. $52C5 = 2,598,960$ combinations
2. $39C7 = 15,380,937$ combinations
3. $3 \cdot 5 \cdot 2 \cdot 6 \cdot 3 \cdot 2 = 1080$ multiplication rule
4. permutations $6!$ or $6P6 = 720$
5. multiplication rule
   $3 \cdot 31 + 3 \cdot 31 \cdot 31 + 3 \cdot 31 \cdot 31 \cdot 31 = 92,349$
   one scoop 2 scoops 3 scoops
6. multiplication rule
   $8 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 = 8 \cdot 10^9 = 8 \times 10^9$
7. permutations $52P5 = 311,875,200$
8. permutations $39P7 = 7.75 \times 10^{10}$
9. $4C2 = 6$ 12, 13, 14, 23, 24, 34
10. multiplication $7 \cdot 5 \cdot 8 \cdot 4 = 1120$
11. $4P4 = 4! = 24$ 1234, 1243, 1324, 1342, 1423, 1432, 2134, 2143, 2314, 2341, 2413, 2431, 3124, 3142, 3214, 3241, 3412, 3421, 4123, 4132, 4213, 4231, 4312, 4321
12. permutations $16! = 16P16 = 2.09 \times 10^{13}$
13. Combinations $17C6 = 12,376$
14. multiplication $12 \cdot 4 = 48$
15. multiplication
    $26^7 \cdot 10^4 = 8.03 \times 10^{13}$
16. $5C3 = 10$ ABC, ABD, ABE, ACD, ACE, ADE, BCD, BCE, CDE, BDE
17. Combinations
    $(32C4)(28C4)(24C4)(20C4)(16C4)(12C4)(8C4)(4C4) =$
    2.39×10^{24}

18. permutations
if 3 officers then $17P3 = 4080$
if 4 officers then $17P4 = 57120$

19. $15C6 = 5005$ (This is technically a special permutation. but when there are only 2 options for outcomes, it looks exactly like combinations)

20. combinations
$300C5 = 1.958 \times 10^{10}$

21. $26+26+10 = 62$ multiplication rule
$62^8 = 2.18 \times 10^{14}$

22. multiplication rule
$4 \cdot 6 \cdot 8 \cdot 10 \cdot 12 \cdot 20 = 460,800$

23. $30C6 = 593,775$ combinations

24. $25^3 \cdot 10^3 = 15,625,000$ multiplication rule

25. $2^{10} = 1024$ multiplication rule

26. $4C4 + 4C3 + 4C2 + 4C1 = 15$

27. permutations $5! = 120$
I could list them all, but I won't here.

28. $6C3 = 20$ (see note on #19)

29. multiplication rule $7 \cdot 5 \cdot 2 \cdot 3 \cdot 3 = 630$