Math160, Spring 2010, Lowman, Answers to Special Assignment #2

1. $\mathbf{2^7}$
2. $\binom{7}{3} + \binom{7}{4} + \binom{7}{5} + \binom{7}{6} + \binom{7}{7}$ or $\mathbf{2^7} - \binom{7}{0} - \binom{7}{1} - \binom{7}{2}$
3. $\mathbf{8!4!5!}$
4. $\frac{\mathbf{14!}}{\mathbf{2!3!4!}}$
5. $\mathbf{2 \cdot 5!} \frac{\mathbf{\cdot 9!}}{\mathbf{2!3!4!}}$
6. $\frac{\mathbf{14!}}{\mathbf{5!2!3!4!}}$
7. $\frac{\mathbf{13}\binom{4}{3}\mathbf{12}\binom{4}{2}}{\binom{52}{5}}$
8. $\frac{\binom{13}{2}\binom{4}{2}\binom{4}{2}\mathbf{44}}{\binom{52}{5}}$
9. $\frac{\mathbf{12!}}{\mathbf{6!6!2!}}$ or $\frac{\mathbf{1}}{\mathbf{2}}\binom{12}{6}$
10. $\boldsymbol{N} = [\mathbf{1} + \binom{5}{1} + \binom{6}{2} + \binom{7}{3} + \binom{8}{4}] \cdot \mathbf{2}$
11. $\boldsymbol{P} = \mathbf{1} - \left[\frac{\binom{70}{0}\binom{30}{4}+\binom{70}{1}\binom{30}{3}}{\binom{100}{4}}\right]$
12. $\mathbf{5/6}$
13. $\mathbf{2/3}$
14. (a) dependent, (b) not mutually exclusive, (c) $\boldsymbol{P} =$ ~~5/8~~
15. $\boldsymbol{P}(\boldsymbol{R}, \boldsymbol{G}, \boldsymbol{R}, \boldsymbol{B}, \boldsymbol{G}, \boldsymbol{R}) = \frac{\mathbf{30 \cdot 35 \cdot 29 \cdot 35 \cdot 34 \cdot 28}}{\mathbf{100 \cdot 99 \cdot 98 \cdot 97 \cdot 96 \cdot 95}}$
16. $\boldsymbol{P}(\mathbf{3}\boldsymbol{R}, \mathbf{2}\boldsymbol{G}, \mathbf{1}\boldsymbol{B}) = \frac{\mathbf{6!}}{\mathbf{3!2!1!}} \cdot$ (Answer from #15)
17. $\boldsymbol{P} = \frac{\binom{30}{3}\binom{35}{2}\binom{35}{1}}{\binom{100}{6}}$, should be same answer as for #16
18. $\boldsymbol{P} = \mathbf{(.85)(.8) + (.15)(.4)} =$
19. $\boldsymbol{P} = \frac{\boldsymbol{P(m_6) \cdot P(D|m_6)}}{\sum_{i=1}^{7} \boldsymbol{P(m_i) \cdot P(D|m_i)}}$ Bayes' Theorem
    $= \frac{\mathbf{(.05)(.4)}}{\mathbf{(.1)(.2)+(.2)(.15)+(.3)(.1)+(.15)(.3)+(.1)(.25)+(.05)(.4)+(.1)(.22)}}$
20. $\boldsymbol{N} = \frac{\mathbf{20!}}{\mathbf{6!10!4!}}$
21. $\boldsymbol{P} = \frac{\binom{13}{2}\binom{39}{2}}{\binom{52}{4}}$
22. $\boldsymbol{P} = \frac{\binom{13}{4}}{\binom{39}{4}}$
23. $\mathbf{0}$
24. $\mathbf{10 \cdot 9 \cdot} \binom{8}{4}$

25. $\binom{10}{0} + \cdots + \binom{10}{10} = \mathbf{2^{10}}$

26. $\mathbf{5/9}$

27. $\mathbf{1}$

28. $\mathbf{2 \cdot 2 \cdot 6!}$

29. $\mathbf{3!4!}$

30. (a) $\mathbf{2 \cdot 5! \cdot 5!}$
    (b) $\mathbf{6 \cdot 5! \cdot 5!}$