

1. – (ungraded) §6.6 – 7.
2. – (ungraded) §7.8 – 3a,b.
3. – (ungraded) §7.8 – 9.
4. – §7.8 – 3d,e (look at the solution to 3a,b),
5. – §7.8 – 11.
6. – §7.8 – 12.
7. – (E) One fine morning, four committees are investigating the same scandal and plan to hold simultaneous hearings. They are interested in grilling eight possible witnesses. For jurisdictional reasons, committee A cannot interview witnesses 1, 2 or 5, committee B cannot interview witnesses 3 or 4, committee D cannot interview witnesses 4 or 6, but committee C can interview everybody. How many ways can the four committees each choose a different witness to interview? (Hint: you have to think a bit before you start calculating.)
8. (E) How many ways are there to arrange the letters “I”, “L”, “L”, “I”, “N”, “O”, “I”, “S” so that none of the letters “N”, “O”, “S” is in its original place; that is “N” is not the 5th letter, “O” is not the 6th and “S” is not the 8th.
9. (E) The grunge-hair 80’s group Neanderthal Detentiøn has four members: Mark, Kerry, Carlos and Matt. During a recent 42-night bus tour, each musician partied a total of 21 nights. Any given pair partied together on 10 nights, any given three partied together on 4 nights. As someone has to watch the amps, there was no night on which all four partied. On how many nights did nobody party?
10. (E) Consider the sequence a_n defined by

$$a_n = \sum_{k=0}^n \alpha^k \cdot \binom{n-k}{k},$$

where α is a fixed, but unspecified, real number. Following the methods of the last homework, find a second order linear recurrence satisfied by $\{a_n\}$. (At least one coefficient should use the letter α !) Find a value of α so that

$$\lim_{n \rightarrow \infty} \frac{a_{n+1}}{a_n} = 3.$$