

1. – (ungraded) §7.8 – 25 a, c, e.
2. – (ungraded) §7.8 – 31.
3. – (ungraded) §7.8 – 37a, b.
4. – §7.8 – 25 b, d.
5. – §7.8 – 38 (answer in the back) .
6. – §7.8 – 39.
7. – §7.8 – 41.
8. (E) A tetrahedral die has four sides, numbered 0, 1, 2, 3. Let a_r denote the number of ways a sum r will show when 7 distinct tetradral dice are tossed.
 - a. Find the generating function for the sequence $\{a_r\}$. You may leave your answer as an unexpanded product or quotient of polynomials.
 - b. Determine a_7 as a sum or difference of a specific product or quotient of integers or binomial coefficients.
9. (E) Let a_n satisfy the recurrence $a_n = na_{n-1} + 1$ for $n \geq 1$ and $a_0 = 1$. Express the exponential generating function

$$A(x) = \sum_{n=0}^{\infty} a_n \frac{x^n}{n!}$$

explicitly, in terms of familiar functions.

10. (E) How many integers are there between 0 and $10^7 - 1$ with the property that in their decimal expansion, there is at least one “2”, at least one “4” and an odd number of “6”’s among their digits? Hint: there is no restriction on the number of occurrences of “0”, “1”, etc.