Solutions To The Even Number Problems

Section 1.1 and 1.2

8.(a) 12!, (b)4!(8!), (c)4!(5!)(3!)

20.(a) \( \frac{8!}{3!} = 6720 \). (b) 6! = 720 ways.

26. \( \frac{14!}{(7!)(7!)} \). Generalized result when going from (a,b) to (a+m,b+n) is \( \frac{(m+n)!}{(m)!!(n)!} \).

28.(a) The for loop for i is executed 12 times, while those for j and k are executed 10-5+1=6 and 15-8+1=8 times, respectively. Consequently, following the execution of the given program segment, the value of counter is

\[ 0 + 12(1) + 6(2) + 8(3) = 48. \]

(b) Here we have three tasks -\( T_1, T_2 \) and \( T_3 \). Task \( T_1 \) takes place each time we traverse the instructions in the \( i \) loop. Similarly, tasks \( T_2 \) and \( T_3 \) takes place during each iteration of the \( j \) and \( k \) loops, respectively. The final value of the integer variable counter follows by the rule of sum.
Section 1.3

4. (a) \(2^6 - 1 = 63\), (b) \(\binom{6}{3}\) and (c) \(\binom{6}{2} + \binom{6}{4} + \binom{6}{6} = 31\).
26. (a) \(\binom{10}{2,2,2,2}\), (b) \(\binom{12}{2,2,2,4}\) and (c) \(\binom{12}{0,2,2,2,4}\).
30. The sum is the binomial expansion of \((1 + 2)^n = 3^n\).
32. \(x = \pm 3\).
Section 1.4, Homework Due

4. (a) \( \binom{31}{12} \), (b) \( \binom{31+12-1}{12} \), (c) Will come up after 6th Feb.

16. \( n = 82 \). (I have explained in the discussion)