

Problem from Section 5.3

2. $P(7, 7) = 7! = 5040$

4. There are 10 combinations and 60 permutations. We list them in the following way. Each combination is listed, without punctuation, in increasing order, followed by the five other permutations involving the same numbers, in parentheses, without punctuation.

123 (132 213 231 312 321) 124 (142 214 241 412 421) 125 (152 215 251 512 521)

134 (143 314 341 413 431) 135 (153 315 351 513 531) 145 (154 415 451 514 541)

234 (243 324 342 423 432) 235 (253 325 352 523 532)

245 (254 425 452 524 542) 345 (354 435 453 534 543)

6. a) $C(5, 1) = 5$ b) $C(5, 3) = C(5, 2) = 5 \cdot 4 / 2 = 10$ c) $C(8, 4) = 8 \cdot 7 \cdot 6 \cdot 5 / (4 \cdot 3 \cdot 2) = 70$
d) $C(8, 8) = 1$ e) $C(8, 0) = 1$ f) $C(12, 6) = 12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 / (6 \cdot 5 \cdot 4 \cdot 3 \cdot 2) = 924$