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MA 110 Quiz 7 ANSWERS

Show your work. State assumptions if you think they are needed or are unsure of mine.

1. How many different three-letter sequences can be formed using different letters from the word **QUIZ**?
   choices of 1st letter x choices of 2nd letter x choices of 3rd letter = 4 x 3 x 2 = 24

2. A New Jersey license plate consists of two letters (AB…XYZ) followed by four digits (012…89). How many such license plates are there?
   26 x 26 x 10 x 10 x 10 x 10 = 6,760,000

3. In how many ways can four books be put into two piles if each pile has exactly two books in it?
   Possible assumptions: (1) the order of books in each pile matters, and (2) the order of the piles matters.
   Possible answers: 3, 6, 12, 24, depending upon assumptions.
   Default (natural) answer is 6. See below for alternatives under various assumptions. If appropriate explicit assumptions are stated and correctly implemented count 2 full credit + 1 extra credit = 3 points. If assumptions are stated, but flawed in execution, mark wrong but count 1+1 = 2 points. If no assumptions are stated, but one of the possible correct answers is given, mark incomplete and count 1 point.
   (a) Assume not-(1) and (2): Ways to choose books for the first pile = (4 x 3)/(2 x 1) = 6. The books in second pile are now determined.
   (b) Assume (1) and (2):
   (books for first pile in order) x (books for second pile in order) =
   = (4 x 3) x (2 x 1) = 24.
   (c) Assume not-(1) and not-(2):
   (unordered ways to choose books in first pile)/ (orders of piles) =
   = [(4 x 3)/(2 x 1)]/(2) = 3. [Note that AB, AC, AD says it all.]
   This is the answer as the other pile and its books are now determined.
   (d) Assume (1) and not-(2):
   (books for first pile in order) x (books for second pile in order)/(order of piles) =
   = (4 x 3) x (2 x 1)/(2) = 12.
   The (natural) default correct answer is (a). If appropriate explicit assumptions are made, (b), (c), or (d) should be counted for full credit. Otherwise, only half credit.

4. An English class has 15 students in it. In how many ways can a committee of four be chosen to bring complaints to the instructor? (No member of the committee has special distinction.)
   choices as if order mattered / duplicates = (15 x 14 x 13 x 12)/(4 x 3 x 2 x 1) = 1,365