Distinguishable Permutation Total points = 68

Problem Set

Α.

1. $n = 8$ \checkmark $p = 2$ \checkmark $q = 3$ \checkmark $P = \frac{n!}{p!q!}$ \checkmark $P = \frac{8!}{2!3!}$ \checkmark $= \frac{(8)(7)(6)(5)(4)(3!)}{(2)(1)(3!)}$ \checkmark $= [3,360]$ \checkmark distinguishable permutations \checkmark 2. $n = 10$ \checkmark $p = 2$ \checkmark $q = 2$ \checkmark $P = \frac{n!}{p!q!r!}$ \checkmark $P = \frac{10!}{2!2!2!}$ \checkmark	$\frac{(11)(10)(9)(8)(7)(6)(5)(4)(3!)}{(3!)(3)(2)(1)}$ $= 1,108,800 \checkmark$ distinguishable permutations $\checkmark n = 10 \checkmark$ $p = 2 \checkmark$ $q = 3 \checkmark$ $r = 2 \checkmark$ $P = \frac{n!}{p!q!r!} \checkmark$ $P = \frac{10!}{2!3!2!} \checkmark$ $= \frac{(10)(9)(8)(7)(6)(5)(4)(3!)}{(2)(1)(3!)(2)(1)}$ $\checkmark = 151,200 \checkmark \text{ distinguishable permutations}$
$= \frac{2!2!2!}{(10)(9)(8)(7)(6)(5)(4)(3)(2!)^{5}}.$ $= \frac{453,600}{(2!)(2)(1)(2)(1)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2)(1)(2)}$ $= \frac{453,600}{(2!)(2!)(2!)(2!)}$	$n = 11$ \checkmark $p = 4$ \checkmark $q = 4$ \checkmark $r = 2$ \checkmark $P = \frac{n!}{p! q! r!}$ \checkmark $P = \frac{11!}{4! 4! 2!}$ \checkmark $= \frac{(11)(10)(9)(8)(7)(6)(5)(4!)}{(4!)(4)(3)(2)(1)(2)(1)}$ \checkmark $= 34,650$ \checkmark distinguishable permutations \checkmark

B.

1.
$$n = 10$$
 \checkmark
 $p = 4$ \checkmark
 $q = 6$ \checkmark
 $P = \frac{n!}{p!q!}$ \checkmark
 $P = \frac{10!}{4!6!}$ \checkmark
 $= \frac{(10)(9)(8)(7)(6!)}{(4)(3)(2)(1)(6!)}$ \checkmark
 $= \boxed{210}$ \checkmark ways \checkmark

2. $n = 8$ \checkmark
 $p = 2$ \checkmark
 $q = 2$ \checkmark
 $r = 2$ \checkmark
 $P = \frac{n!}{p!q!r!}$ \checkmark
 $P = \frac{8!}{2!2!2!}$ \checkmark
 $= \frac{(8)(7)(6)(5)(4)(3)(2!)}{(2!)(2)(1)(2)(1)}$ \checkmark
 $= \boxed{5,040}$ \checkmark distinguishable permutations \checkmark

3. $n = 6$ \checkmark
 $p = 2$ \checkmark
 $q = 3$ \checkmark
 $P = \frac{n!}{p!q!}$ \checkmark
 $P = \frac{6!}{2!3!}$ \checkmark
 $= \frac{(6)(5)(4)(3!)}{(2)(1)(3!)}$ \checkmark
 $= \boxed{60}$ \checkmark distinguishable permutations \checkmark

(11)(10)(9)(8)(7)(6)(5)(4)(3!)

Problem Set

1. *n* = 8 ✓

A.

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В.
   1. n = 10 \checkmark
         p = 4 ✓
         q = 6 \checkmark
         P = \frac{n!}{n!}
         P = \frac{n!}{p! \, q!} \checkmark
P = \frac{10!}{4!6!} \checkmark
= \frac{(10)(9)(8)(7)(6!)}{(4)(2)(2)(7)(6!)}
                (4)(3)(2)(1)(6!)
          = 210 √ ways √
   2. n = 8 \checkmark
         p = 2 ✓
         q = 2 ✓
         r=2 \sqrt{n!}
                 p!q!r!
         P = \frac{\frac{8!}{2!2!2!}}{\frac{2!2!2!}{(2!)(7)(6)(5)(4)(3)(2!)}} \checkmark
= \frac{(8)(7)(6)(5)(4)(3)(2!)}{(2!)(2)(1)(2)(1)} \checkmark
                    (2!)(2)(1)(2)(1)
         =5,040 \checkmark distinguishable permutations \checkmark
   3. n = 6 \checkmark
         p=2
          q = 3 ✓
         P = \frac{n!}{n!}
                \frac{1}{p!q!} \checkmark
          P = \frac{6!}{2!3!} \checkmark
= \frac{(6)(5)(4)(3!)}{(2)(1)(3!)}
                 (2)(1)(3!)
          = 60 \checkmark distinguishable permutations \checkmark
```