

1-13. The manager of a small plant wishes to determine the number of ways he can assign workers to the first shift. He has 15 workers who can serve as operators of the production equipment, eight who can serve as maintenance personnel, and four who can be supervisors. If the shift requires six operators, two maintenance personnel, and one supervisor, how many ways can the first shift be manned?

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We need to choose 6 operators out of a pool of 15, and "the order does not matter." This means that there is nothing special about the six operator positions

$$N_o = \binom{15}{6} = 5005$$

We need to choose two maintenance personnel out of a pool of 8, and again, order does not matter

$$N_m = \binom{8}{2} = 28$$

Choose one supervisor out of 4

$$N_s = \binom{4}{1} = 4$$

It should be obvious that we multiply these three numbers to get the final answer, but if it isn't obvious, this is an application of Principle 1 on p. 47 of your textbook:

$$5005 \cdot 28 \cdot 4 = 560,560$$