Permutations and Combinations Worksheet
Answer Key

As a Matter of Factorial...

1. How many ways are there to order 5 books on a shelf?
   \[5! = 120\]

2. Simplify \(10P_6\).
   \[\frac{10!}{6!} = 5040\]

3. How many ways can we order 6 computers if we have only space for 3?
   \[\frac{6!}{3!} = 120\]

4. How many ways can we order 8 swimsuits in 4 lockers?
   \[\frac{8!}{4!} = 1680\]

5. How many ways can we choose 4 t-shirts from 6 t-shirts with repetitions allowed?
   \[6^4 = 1296\]

6. How many 10-digit phone numbers are there?
   \[10^{10}\]

7. How many playlists can we make with 38 songs if we can repeat 5 songs in each playlist?
   \[38P_{33} = 38 \times 37 \times 36 \times 35 \times 34\]

8. How many combinations of playlists can we make with 10 songs when there are 5 songs in each and order does not matter?
   \[10C_5 = \frac{10!}{5!5!}\]

9. A drawer contains 6 white t-shirts and 2 red ones. If 2 shirts are drawn at random, what is the probability of getting 2 white shirts?
   \[\frac{6C_2}{8C_2} = \frac{15}{28}\]

10. There are 10 pink, 15 purple, and 5 green jelly beans in a jar. If two jelly beans are drawn at random (without replacement) what is the probability that both are green?
    \[\frac{5C_2}{30C_2} = \frac{2}{87}\]

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