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 ${}_{10}P_6$.
   $\frac{10!}{6!} = 5040$

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?
   ${}_{38}P_{33} = 38 \times 37 \times 36 \times 35 \times 34$

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

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?
    $\frac{{}_5C_2}{{}_{30}C_2} = \frac{2}{87}$
