Math 4190 — Goddard — Fall23

Class Sheet 1: Counting

I have 30 different books, including the BookThief and all 3 in the HungerGames trilogy.

1. In how many ways can all the books be arranged on my shelf with all three books of the trilogy next to each other (but in any order)?

   Glue trilogy together: $3!$
   now have 28 books.
   So $28! \times 3!$

2. In how many ways can all the books be arranged on my shelf with the BookThief to the left of all three books of the trilogy (but the trilogy in any order and not necessarily consecutive)?

   $B T I T I$

   $30! / 4$

3. If I pick a subset of 5 books at random, what are the odds it contains the BookThief?

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   \frac{\binom{29}{4}}{\binom{30}{5}} = \frac{1}{6}
   \]