Board questions set 1

Problem 1: Olympics

There are 5 competitors in the 100m final. In how many ways can gold, silver and bronze be awarded?

Problem 2: Coin flips

(a) Count the number of ways to get exactly 3 heads in 10 coin flips.

(b) For a fair coin, what is the probability of exactly 3 heads in 10 flips?

Problem 3: Poker

A deck of cards contains 52 with **13 ranks** (2, 3, …, 9, 10, J, Q, K, A) and **4 suits** (♡, ♠, ♢, ♣). A poker hand is a set of **5 cards**. A **one-pair** is a poker hand with two cards having one rank and the remaining three cards having different ranks. For example: $\{2♡, 2♠, 5♡, 8♣, K♢\}$

(a) How many different 5-card hands have exactly one pair?
Hint: practice with how many 2 card hands have exactly one pair.
Hint for hint: use the rule of product.

(b) What is the probability of getting a one pair poker hand?

CREDITS Adapted from MIT course 18-05 by Jeremy Orloff and Jonathan Bloom, see ocw.mit.edu