HWK ~~1.3~~ 1.2 (old ed. = 1.3)

1.3-7 There are $N = 10^4$ possibilities; $|S| = 10^4$. We calculate

$$\frac{\#\text{distinguishable permutations}}{N}$$

a) $= 4!/N = .0024$
c) $(4!/2!2!) \div N = .0006$

new ed. 9 **~~1.3-11~~** Show that
- There are at most 7 games and at least ? games.
- Let x be the number of games and A wins. Then the number of possibilities is ${}_{x-1}C_3$. The answer is twice this number.

ok 17 **1.3-17** There are $N =_{52} C_5 = 2,598,960$ poker hands (Example 1.3-9).
d) Hand of type 2-2-1.
- Choose the values for the pairs $= \frac{13\cdot 12}{2} =_{13} C_2$ possibilities.
- Choose the value for the singleton $= 11$ possibilities.
- Choose the suits for the first pair $=_4 C_2 = \frac{4\cdot 3}{2}$.
- Choose the suits for the second pair $=_4 C_2 = \frac{4\cdot 3}{2}$.
- Choose the suit for the singleton $=_4 C_1 = 4$.
- Multiply and divide by N

$$p = \frac{\frac{13\cdot 12}{2}\cdot 11\cdot \frac{4\cdot 3}{2}\cdot \frac{4\cdot 3}{2}\cdot 4}{\frac{52!}{5!\cdot 47!}} = \frac{123552}{2,598,960} = 0.047539016$$

The homework is the one posted

1.2 / 9, 10, 12, 13, 17

- you need to work out and explain your answers for full credit.
- use the extra problems solved here for practice.
- read the solved examples in the book

Problem 12

BINOMIA FORMULA

$$(A+B)^n = \sum_{k=0}^{n} \binom{n}{k} A^k B^{n-k}$$

(i) $A = -1$ $B = 1$ gives the answer.

(ii) done in class.

Problem 13

(a)

$$\frac{\binom{13}{5}\cdot\binom{13}{4}\cdot\binom{13}{3}\binom{13}{1}}{\binom{52}{13}}$$

This explains the rest.

$$\binom{52}{13} = \binom{13+13+13+13}{5+4+3+1}.$$

Problem 16 Similar with 13

(a) $$\frac{\binom{19}{3}\binom{52-19}{9-3}}{\binom{52}{9}}$$ ← selections disregarding colors

So: we need three white out of 19 white.

the rest means $52-19 = 33$ (all other colors)

we need to pick $9-3 = 6$

(b) $$\frac{\binom{19}{3}\binom{10}{2}\binom{7}{1}\binom{5}{1}\binom{6}{2}\binom{5}{0}}{\binom{52}{9}}$$