

BE-18 TUESDAY 5-1-07

- ① RED, WHITE, blue dice (ONE EACH).
How many possible "rolls"
are there?
 - ② WHAT is the probability of
rolling "red 2, blue 2, white 2"?
-

(1.)

PERMUTATION AN ARRANGEMENT OF items
WHERE ORDER IS IMPORTANT.

$${}_N P_r = \frac{N!}{(N-r)!}$$

COMBINATION AN ARRANGEMENT OF items
WHERE ORDER DOES NOT MATTER

$${}_N C_r = \frac{N!}{(N-r)! r!}$$

EX) You are putting 8 books on a shelf that holds 3 books, how many combinations of 3 books are there? (ABC same as ACB or CBA etc.)

$${}_8 C_3 = \frac{8!}{(5)! 3!} = \frac{8 \cdot 7 \cdot 6}{\cancel{3} \cdot \cancel{2} \cdot \cancel{1}} = \boxed{56}$$

NOTE: WHEN ORDER is important,
more arrangements are possible.
But when order is NOT important,
the number of arrangements are
less — the EXACT amount less is
found by $\div$ by $r!$

EX 5
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Pick 12 of 16 students to be
peer tutors. How many ways
can you pick them?

Order NOT important $\therefore nCr = \frac{n!}{(n-r)!r!}$

$$16C_{12} = \frac{16!}{4!12!} = \frac{\overset{4}{16} \cdot \overset{5}{15} \cdot \overset{7}{14} \cdot 13}{\underset{1}{4} \cdot \underset{1}{3} \cdot \underset{1}{2} \cdot 1}$$

$$= (140)(13)$$

$$= \boxed{1820}$$

3

How would you solve this?

$$(6P_4)(5C_2) = ?$$

$$\left(\frac{6!}{2!}\right)\left(\frac{5!}{3!2!}\right)$$

$$(6 \cdot 5 \cdot 4 \cdot 3) \left(\frac{5 \cdot \cancel{4}^3}{\cancel{2} \cdot 1}\right)$$

$$(360)(10) = \boxed{3600}$$

NOTE: MOST SCIENTIFIC CALCULATORS
HAVE nPr AND nCr KEYS

CW/
HW: Pg 764-765 # 14-33