Number properties.

A: 2 digit number
= $\boxed{x}\boxed{y}$
$= 10x + y$.

$A = \boxed{x}\boxed{y}$
$B = \boxed{x}\boxed{x}$
$A - B = 9x + 9y = 9(x+y)$
↳ factor '9'

% Strategy.

	Numbers	% / fraction
Part	x?	30
whole	80	100

eg. 30% of 80 $\quad \frac{x}{80} = \frac{30}{100}$

* % ↑ or ↓

change	4	x?
original	80	100

eg. coffee 80 → 84 cents. % change?

* If qty in ↑ by x%, then new qty is (100+x)% of the original.
(vice versa)

PTO

Very Very weak

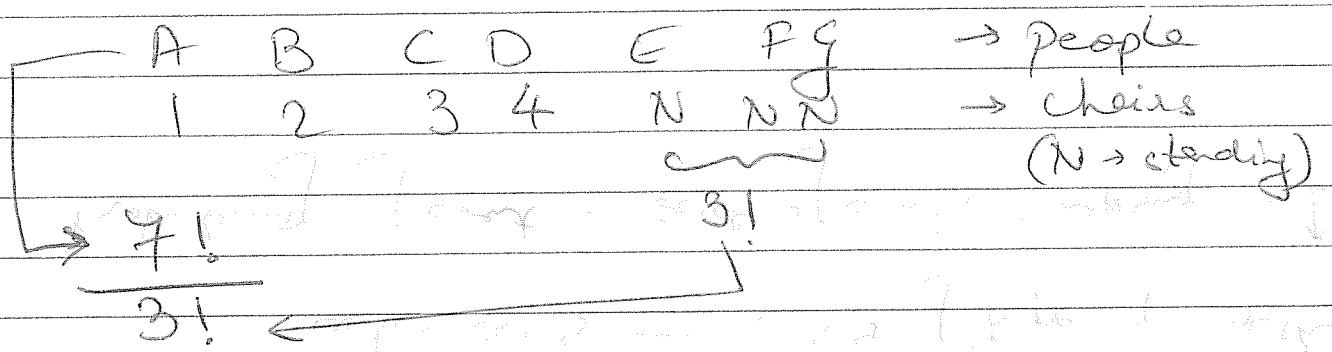
Math — Combinatorics

Permutation : Order matters
Combination : Order does NOT matter

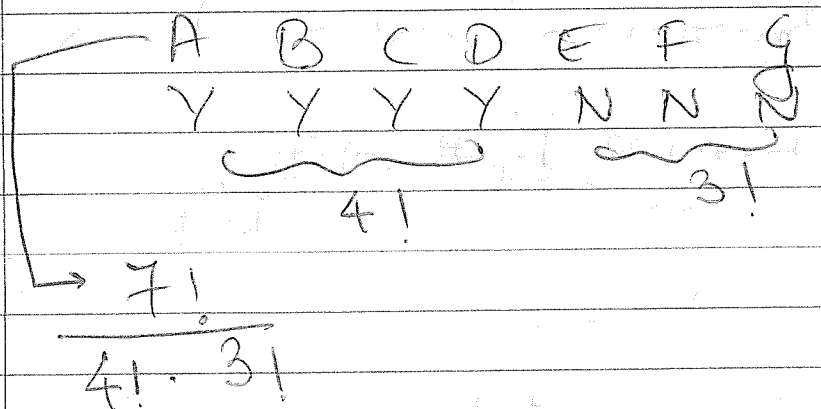
Uses Anagram model.

Use numbers when order matters.
Use Y/N when order does not matter.

① 7 people, 4 chairs. How many seating arrangements?



② Team of 4 from 7. How many?



Number

Divisibility & Primes Strategy

Divisibility Rules:
- 2, 5, 10 – simple
- 4: last 2 by 4
- 3: sum of all by 3
- 6: by 2 AND by 3
- 8: last 3 digits by 8
- 9: sum by 9

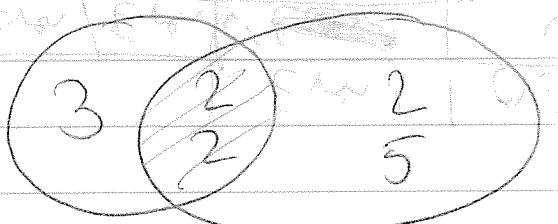
→ If you add/subtract multiples of N, result is multiple of N

PRIME FACTORS

GCF & LCM

12 = 3 × 2 × 2

40 = 2 × 2 × 2 × 5



↑ common primes, counted once

4 no

GCF: product of shared prime

LCM: product of all primes, counting shared ones once.

→ 2 is first & only even prime

Math. Exponents

$x^a \cdot x^b = x^{a+b}$ $\quad 5(5^n)+5^1(5^n) = 5^{n+1}$

$a^x \cdot b^x = (ab)^x$

$\frac{x^a}{x^b} = x^{a-b}$

$\left(\frac{a}{b}\right)^x = \frac{a^x}{b^x}$

$(a^x)^y = a^{xy} = (a^y)^x$

$x^{-a} = \frac{1}{x^a}$

$x^{a/b} = \sqrt[b]{x^a} = \left(\sqrt[b]{x}\right)^a$

$a^x + a^x + a^x = 3a^x$

a^0	$= 1$
a^1	$= a$
a^{-1}	$= 1/a$

$x^2 = 16$

$x = \pm 4$

$\frac{12^7}{3^7} = \frac{4^7 \cdot 3^7}{3^7}$

Note

$a^x \cdot a^y \neq a^{xy}$

$= a^{x+y}$

$(a^x)^y = a^{xy}$