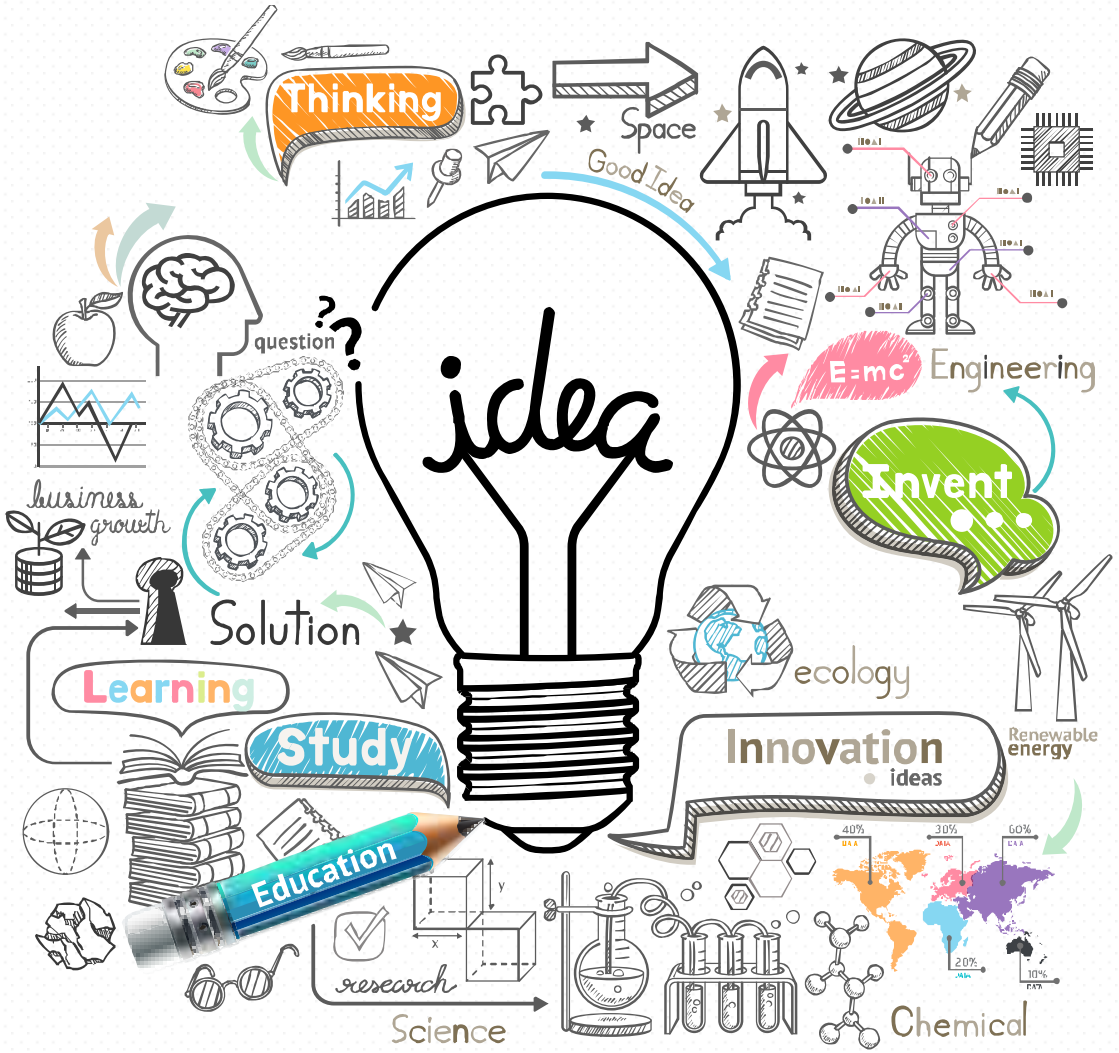


2023 GEP Seminar

Contents

Part 1. Screening test sprint

Part 2. How to Prepare Selection test

Part 3. Introduction to MO

Contents

Screening test sprint

Mock exam

Exam format

Screening Mock Exam		
Time	Question type	Number
75min	MCQ	20
	SAQ	20

1.Calculator use is not allowed.
2.It is required to fill in the answer sheet.

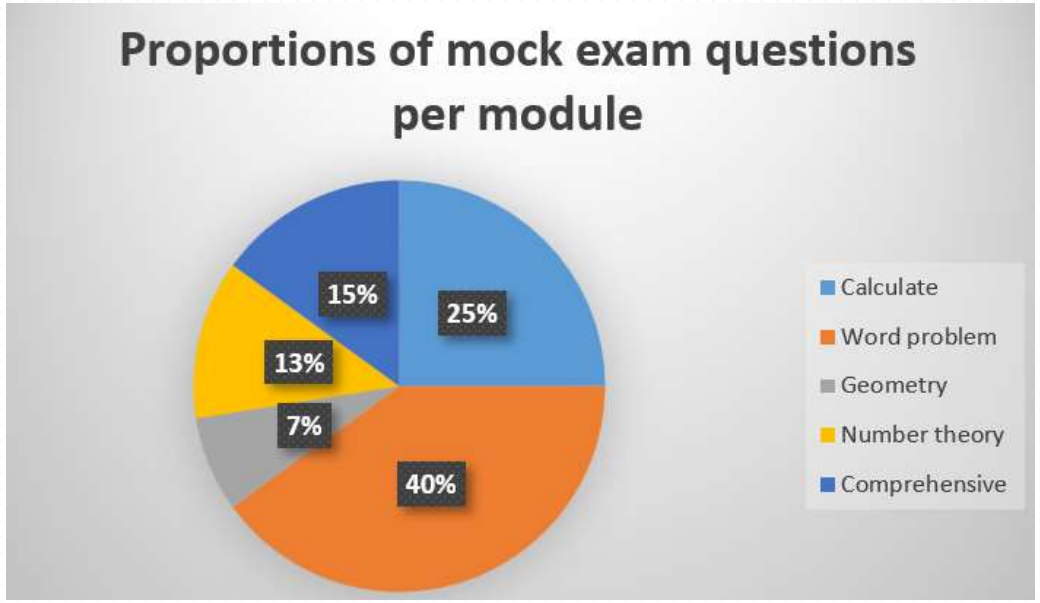
Mock exam

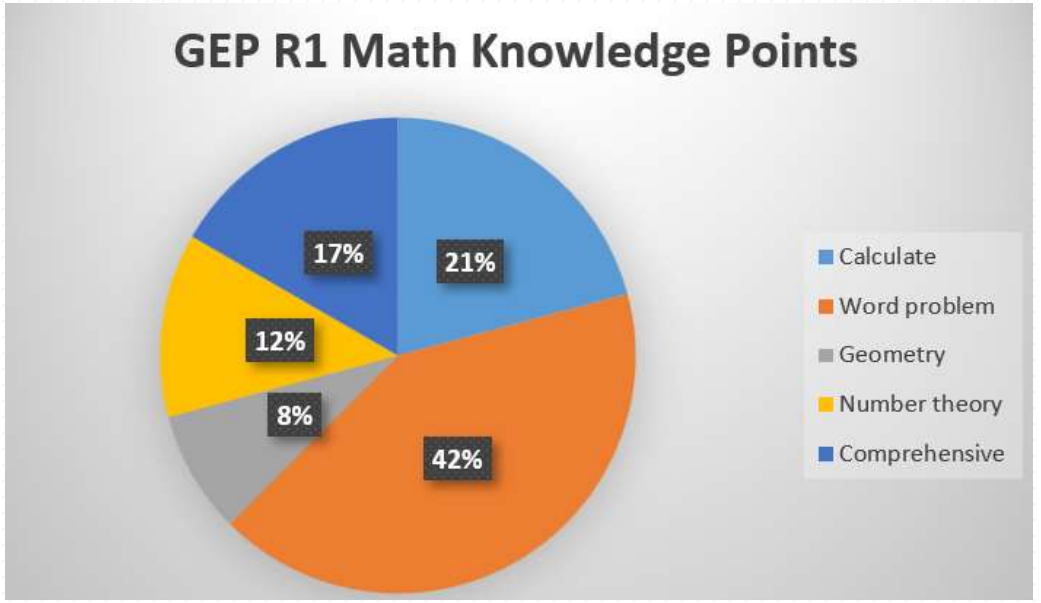
Exam content

Mock exam knowledge points			
Digit value	Multiple	Comparing Fractions	Fraction problem
Money problem	Quantity problem	Variable problem	D-M problem
Characteristics of Fractions	Whole number	Parallel lines	Angles
Equivalent substitution	Queueing problem	Conversion of time units	Pattern with numbers
Digit and number	Characteristics of Fractions	Excess and shortage	Equivalent substitution
Remainder	Pattern with numbers	Bar chart	S-D problem
Angles	Digit and number	Time calculation	Vertical puzzle
Area and fraction	Pattern with figures	Chicken and rabbit	Quantity problem
Volume calculation	Variable problem	S-M problem	Working backwards
Pattern with figures	Planting problem	Age problem	Excess and shortage

Mock exam

Exam content





Difficulties in R1

1. Mastery of Knowledge Points

2. Problem-Solving Speed

3. Problem-Solving Accuracy Rate

Screening Test		
Time	Question type	Number
75min	MCQ	20
	SAQ	20

75min
40
1.8min/Q

Screening Test		
Time	Question type	Number
90min	MCQ	25
	SAQ	25

90min
50
1.8min/Q

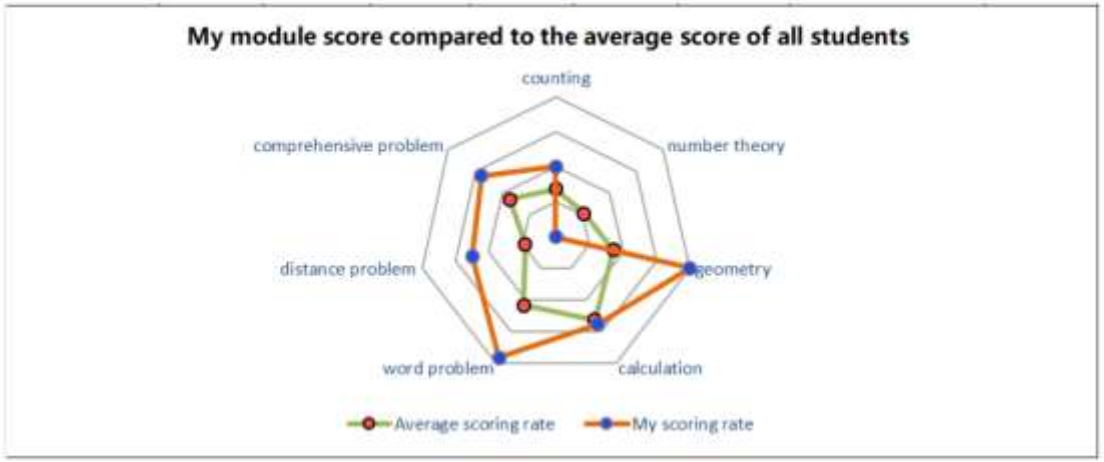
PAIS REPORT

Mastery of each module and relative mastery levels.

Specific knowledge points that are not well mastered in each module.

Part 2: The "PAIS" feedback of each of my modules

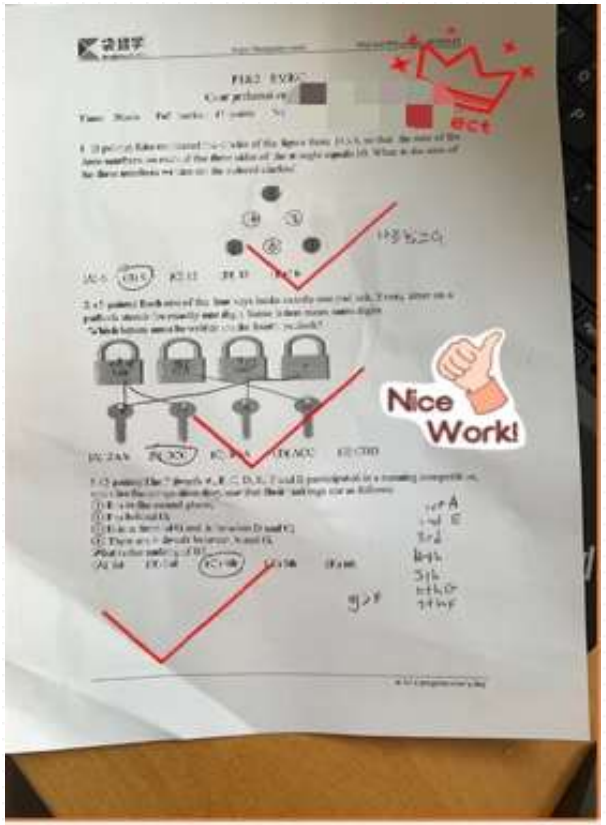
Module	counting	number theory	geometry	calculation	word problem	distance problem	comprehensive problem	Total
Full marks	10	6	10	18	34	4	18	100
My scores	4	0	8	10	26	2	10	60
My scoring rate	40.0%	0.0%	80.0%	55.6%	76.5%	50.0%	55.6%	60.0%
Average scoring rate	27.3%	21.2%	34.5%	52.5%	43.3%	18.3%	34.3%	39.0%



Part 3: Detailed diagnostic analysis of my answers to each

Module	Scores	Evaluati	Individualized recommendations for each module
counting	4	★★	I'm sorry you didn't do very well in the counting module. Maybe you need some more systematic advice. The counting module focuses on the method of enumeration and the principle of exclusion. Enumeration needs to be classified and ordered so that you can neither repeat nor miss numbers. Question 14, for example, can be solved by enumeration, enumerated in order from smallest to largest. The key to the principle of capacitive repulsion is to figure out the relationship between quantities by drawing a diagram. It is recommended that you start with basic counting, improve your proficiency with enumeration, and then try to solve problems using the multiplication principle. Come on! You will become more and more skilled in counting.
number theory	0	★	You lost all marks in number theory questions, indicating that you are not very skilled in the basics of number theory. Number theory is an important branch to study the properties of whole numbers, as well as an important theoretical basis of programming and coding, so we must pay attention to it! There are 3 number theory questions in this exam, which are bit-value principlein question 17 and question 33, and parity analysis in question 34. For problems on the bit-value principle, it is often necessary to split the number and represent this number by the number in each digit. I believe you will be more and more skillful during the process of thinking and summarizing.

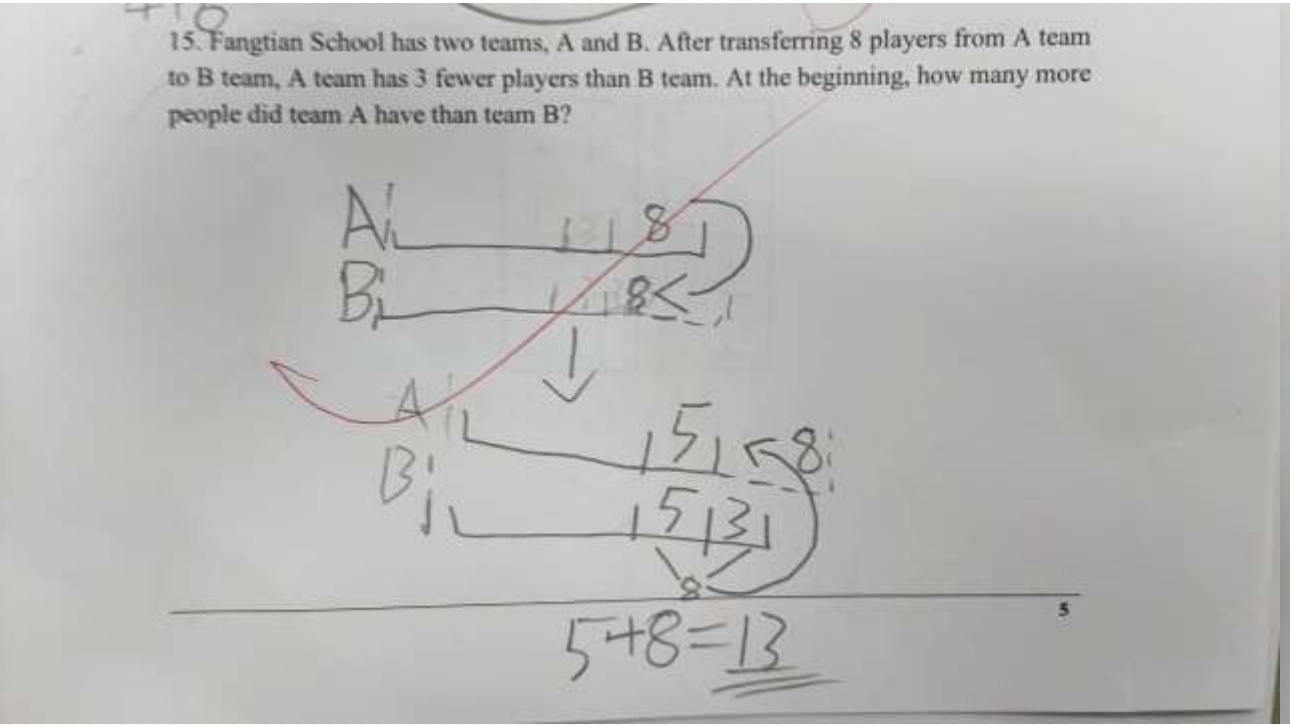
Time-limited check-in exercise

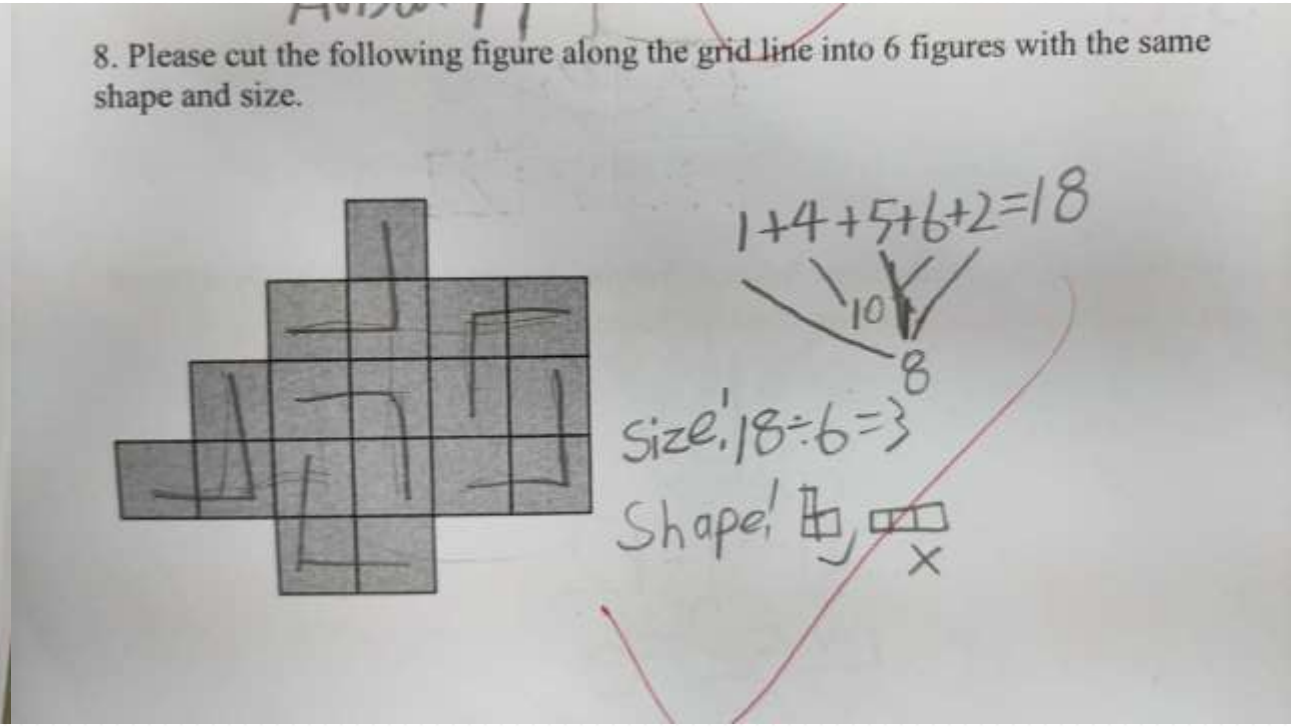


，太厉害啦！全对，并且过程完整思路清晰！第一题，除了可以全部填出来，也可以直接整体考虑。三角形有三条边，每条边的和是10，加起来就是30；而三条边上所填的6个数的和是1+到6，也就是21。30比21多了9，多的9正是重复用的3个格子。千里之行始于足下，继续努力！

Improve the accuracy rate

Steps





Improve the accuracy rate

Calculation

Timed and Quantitative

Planning

Kangaroo 2023 GEP preparation planning								
	Mon	Tue	Wen	Thu	Fri	Sat	Sun	Activity
July	17	18	19	20	21	22	23	R1 Mock exam
	24	25	26	27	28	29	30	Review class with feedback
	31							Daily practice+open class
August		1	2	3	4	5	6	
	7	8	9	10	11	12	13	
	14	15	16	17	18	19	20	Pre-exam precautions+R1

Contents

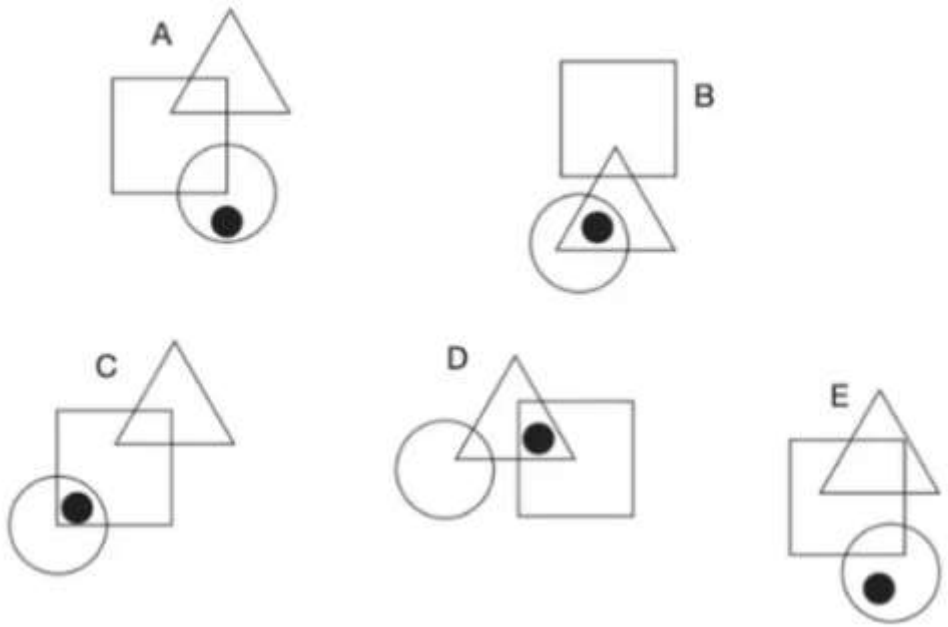
How to Prepare GEP Selection Test

Difference

1. GA

Pattern

Which is the odd one out?

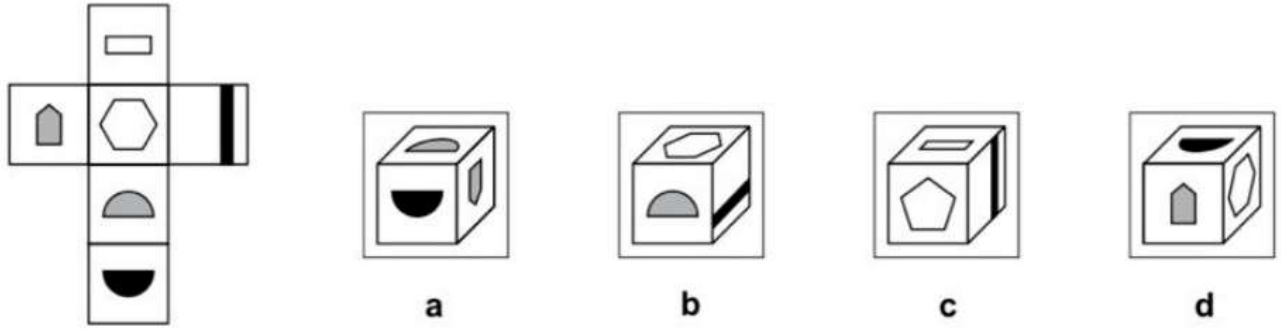


Difference

1. GA

Spatial Awareness

Work out which of the four cubes can be made from the net?



Difference

1. GA

Logical reasoning

In a fishing competition, five kids caught 50 fish in total. A is the winner, she got 12 fish. Band C caught the same number of fish and both are at second place. D is at fourth place. E came in last got only 6 fish. How many fish did B get?

Difference

2. Format

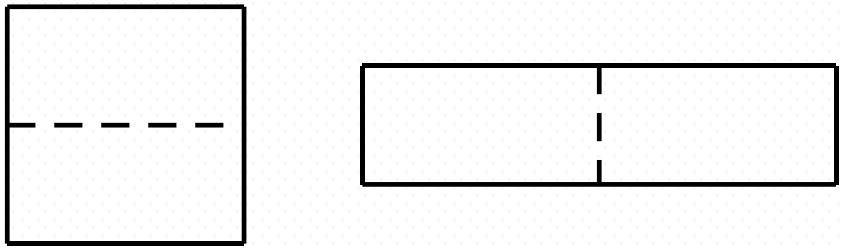
Duration	75min 40 1.8min/Q	→	110min 48 2.2min/Q
MCQ	4 choices	→	5 choices

Difference

3. Content

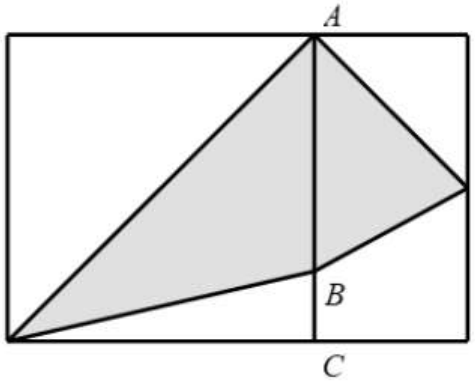
Perimeter

A square of perimeter 48 cm is cut into 2 Pieces to make a rectangle. What is the perimeter of the rectangle?



Area

As shown in the figure below, AB=4BC, What is the fraction of the shaded area in the total area?



Difference

4. Difficulty

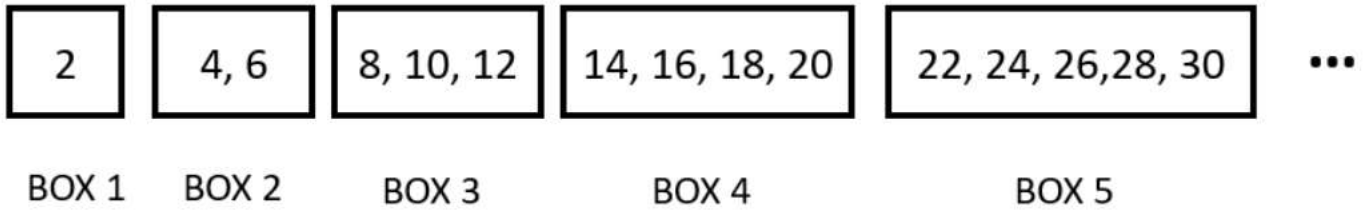
Screening Test: Pattern

1. Find the pattern and fill in the blanks

（1）1，3，5，7，9，11，_____，_____，17……；

Selection Test: Pattern

What is the last number in Box 20?



Preparation

R1 Result: Early October

R2 : Tuesday, 17 October 2023, and Wednesday, 18 October 2023

Kangaroo 2023 GEP preparation planning								
	Mon	Tue	Wen	Thu	Fri	Sat	Sun	Activity
Aug	14	15	16	17	18	19	20	R1
	21	22	23	24	25	26	27	Open class+ practice
	28	29	30	31				
SEP					1	2	3	Open class+ practice
	4	5	6	7	8	9	10	Open class+ practice
	11	12	13	14	15	16	17	R2 Mock exam
	18	19	20	21	22	23	24	Explanation class
	25	26	27	28	29	30		Daily practice
OCT							1	
	2	3	4	5	6	7	8	R1 Result
	9	10	11	12	13	14	15	R2 Sprint
	16	17	18	19	20	21	22	R2

Contents

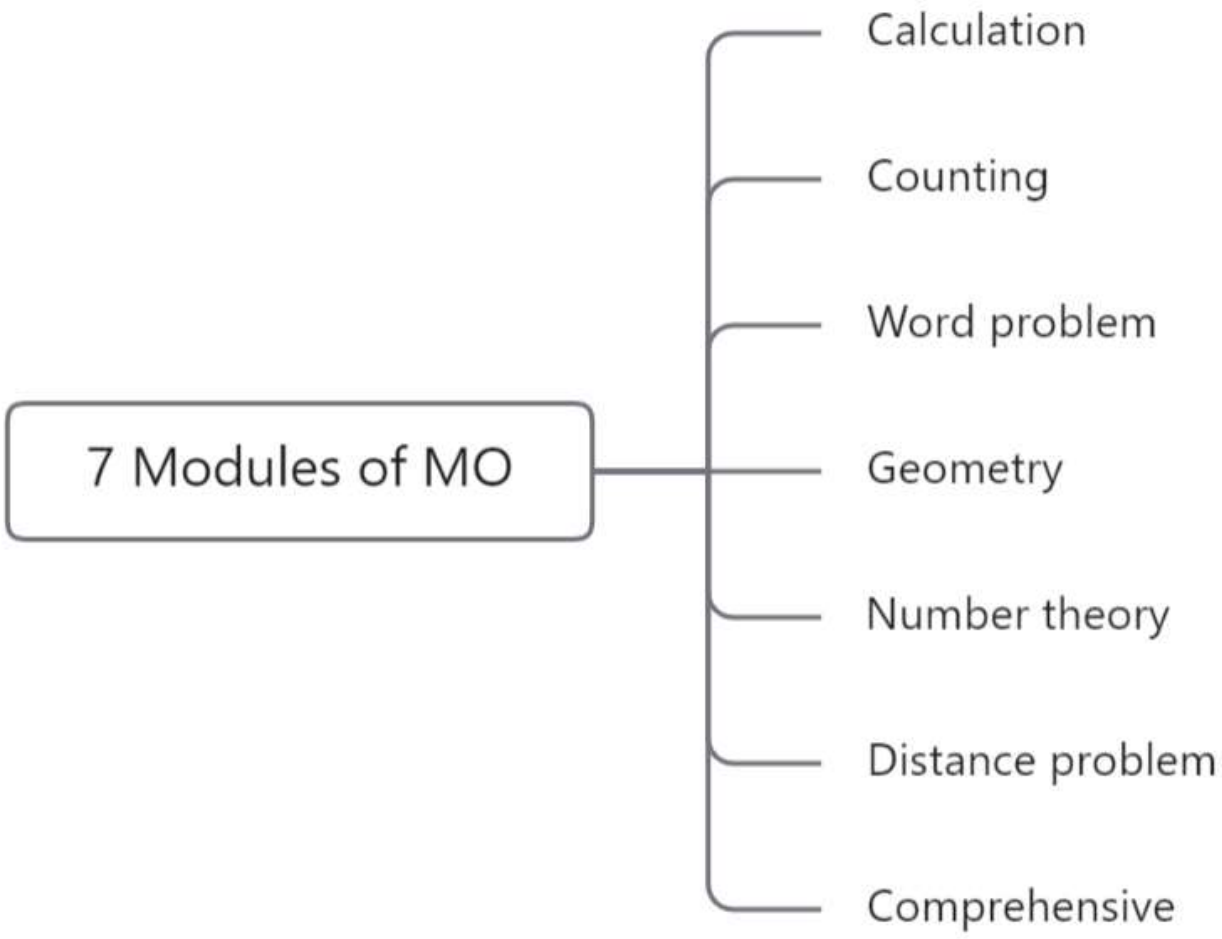
Introduction to MO

What is MO?

MO: A series of expansive mathematical systems and methods based on primary school students' knowledge scope.

What is MO?

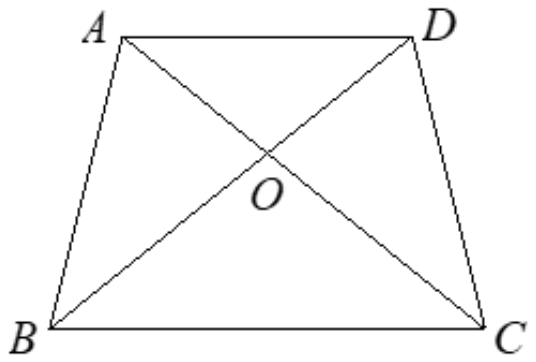
1.Systems



What is MO?

2. Olympiad math is not about learning in advance.

In the isosceles trapezoid ABCD, OB is 1.5 times the length of OD, and the area of triangle OBC is 9 square centimetres. What is the area of triangle OAD?

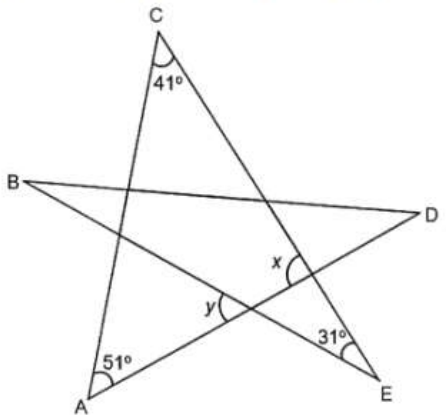


What is MO?

3. Olympiad math is exploratory and expansive.

2020-PSLE-Math-Paper2-Q6

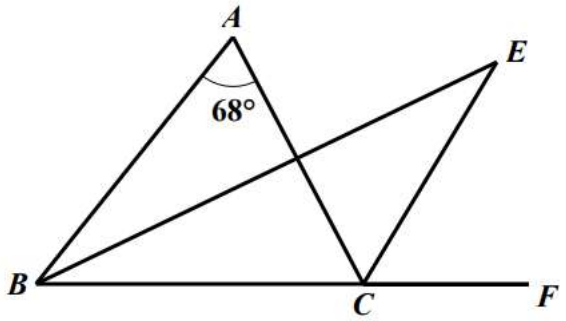
6. The figure is formed by five straight lines AC, AD, BD, BE and CE.



(a) Find $\angle x$.
(b) Find $\angle y$.

2021-NMOS-R1-Q11

11. In the diagram below, BCF is a straight line. BE and CE intersect at point E. It is known that $\angle ABE = \angle EBC$, $\angle ACE = \angle ECF$, and $\angle BAC = 68°$. Find $\angle BEC$ in degrees.



The Purpose of MO Learning

1. DSA

Non-school based Awards/Activities

Period(s)	Awards/Activities Name	Brief Description
04/2022 - 04/2022	RIPMWC Round 2	High Distinction
03/2022 - 03/2022	RIPMWC Round 1	High Distinction, 99.7 percentile
04/2021 - 04/2021	2021 SMOPS	Platinum Award, 12th Place
05/2021 - 05/2021	2021 NMOS	Gold Award, 17th Place
08/2021 - 08/2021	Annual Mathlympics 2021	Gold Award, Top 3 in South Zone
06/2021 - 06/2021	2021 RSO (Raffles Science Olympiad)	Bronze Award
05/2021 - 05/2021	2021 SPSO	Merit Award
08/2020 - 08/2020	2020 Annual Mathlympics	Gold Award
04/2020 - 04/2020	2020 SASMO	Grade 06, Gold Award

Three competitions

含金量高的奥数竞赛

NMOS

SMOPS

High Gold: Top 1.5% 约280枚

Platinum: Top 5% 约240枚

Distinction: Top 8.5% 约400枚

Silver: Top 30% 约300枚

Bronze: Top 20% 约120枚

RIPMWC

Three competitions

Some experience about DSA:

1. SMOPS Silver: No written test required in DSA to HCI

2. NMOS TOP 30: CO of NUSH

3. Math DSA written test questions are MO questions.

Our results

Kangaroo.Study

Kangaroo Study has only been established in Singapore for over half a year and our students have achieved outstanding results in various competitions, including:

Contests:	Year:	Results:	Percentage:
NMOS	2022	16 participated 4 Gold awards 8 Silver awards	Award-winning rate: 75% of our students winning Silver and above
SMOPS	2023	21 participated 4 Platinum awards (Only 50 Platinum recipients) 4 Gold awards 8 Silver awards 2 Bronze awards	Award-winning rate: 20% of our students winning Platinum (Only top 1.5% receive Platinum) 52% of our students received awards (only 20% pariticipants receive awards)
RIPMWC	2023	25 participated 11 invited to Round 2 (1 of our students is the top 1 scorer in open category)	Percentage of students invited to Round 2: 44%
SMO	2023	10 participated 10 invited to Round 2	Percentage of students invited to Round 2: 100%

Kangaroo.Study

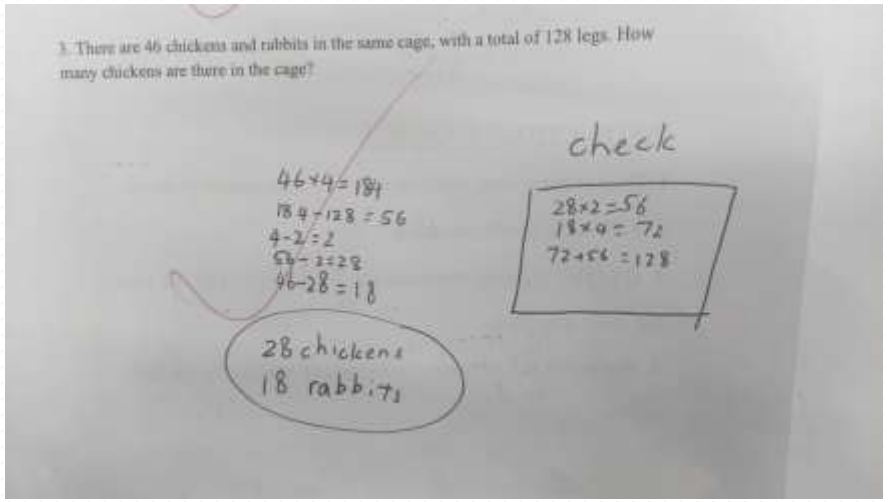
Excellent individual awards

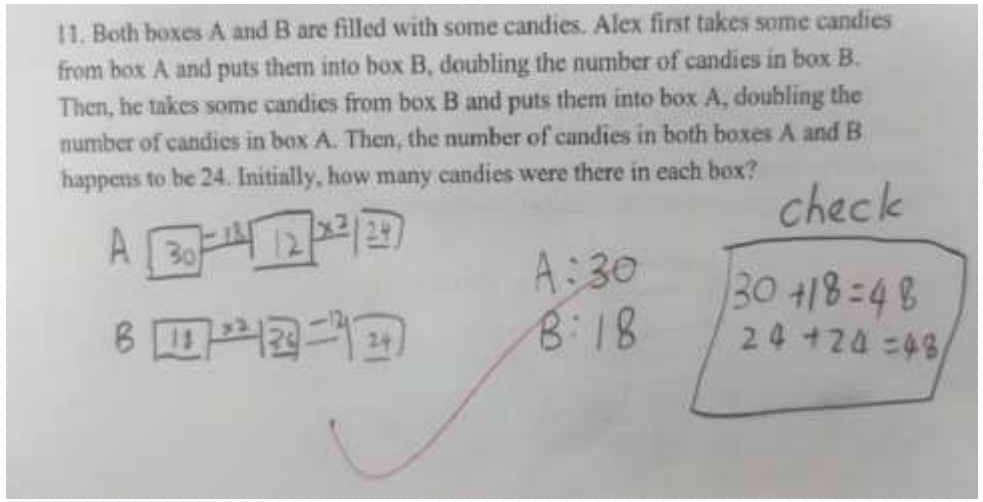
Contests:	Results:
IMSO	Overall 1st
RIPMWC	Top 1 scorer in open category
SMO Junior Team	3(P6)
RI Euler Class	7/20

The Purpose of MO Learning

2. Cultivate correct learning habits

(1). Problem-solving habits.

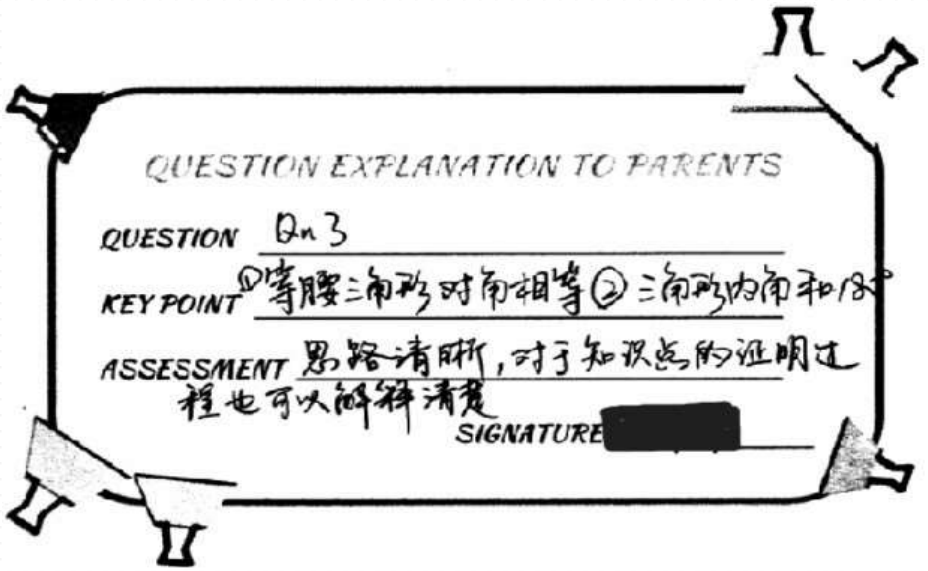




The Purpose of MO Learning

2. Cultivate correct learning habits

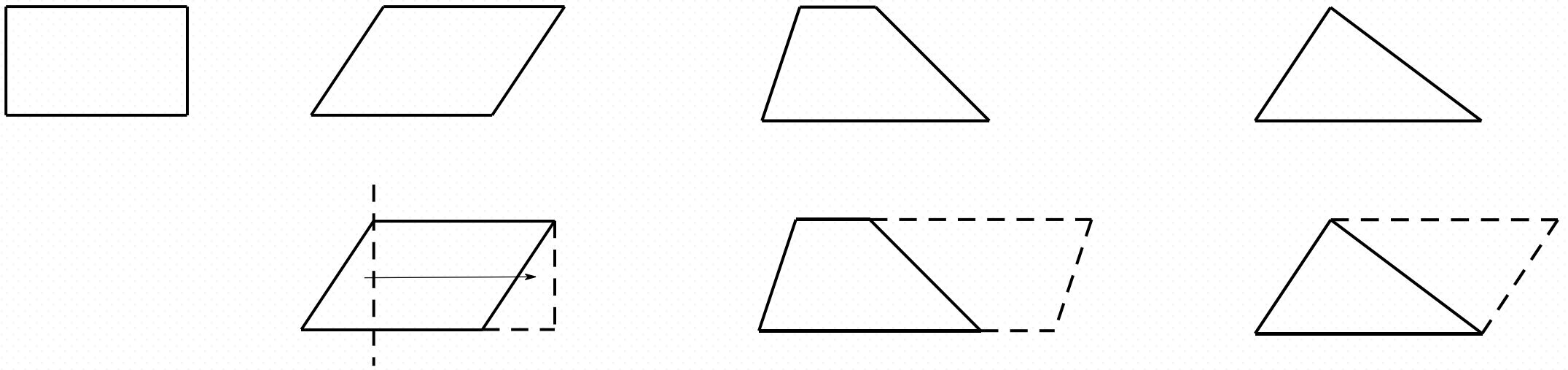
(2). Study habits



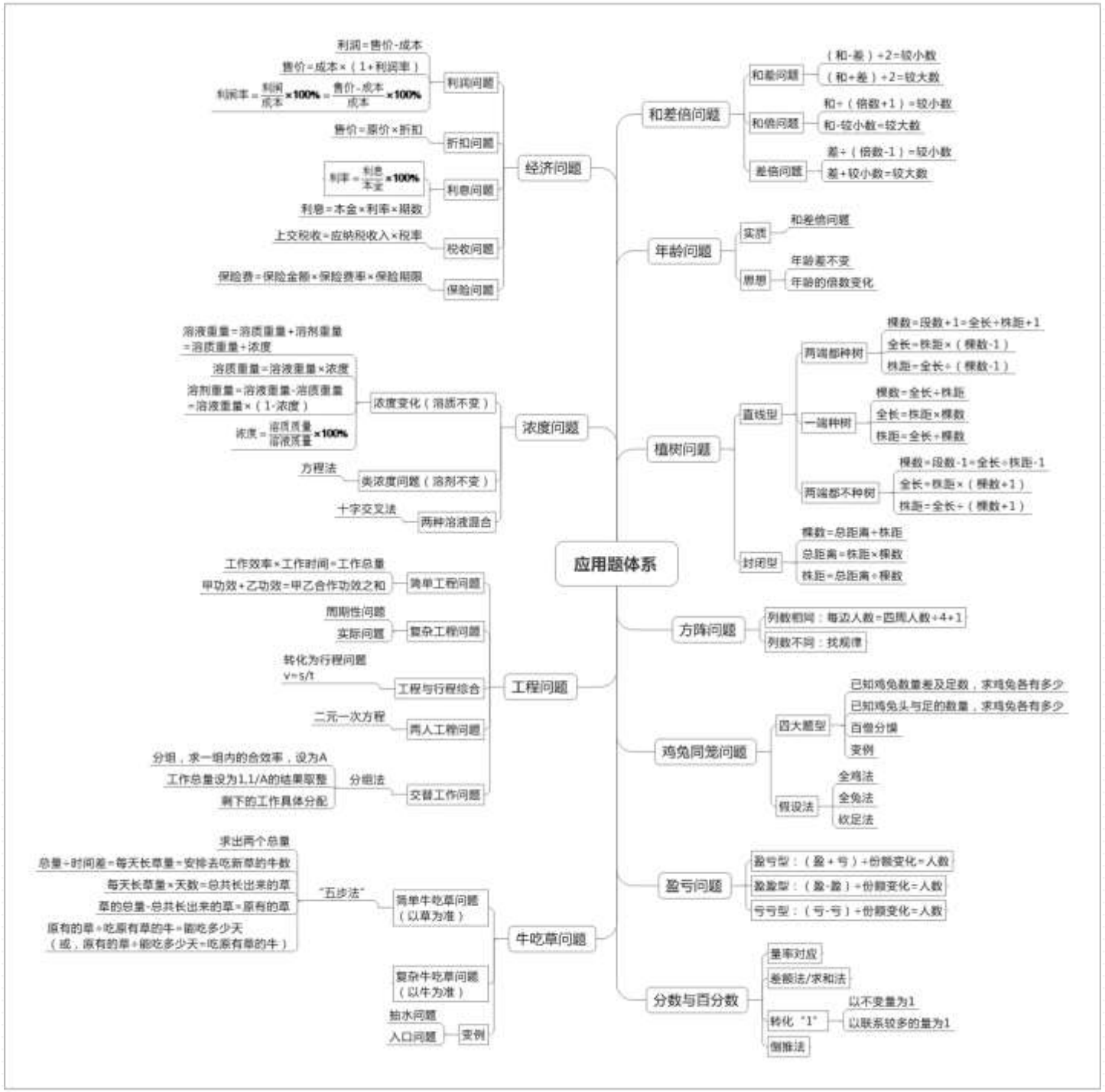
The Purpose of MO Learning

3. Cultivate mathematical ideas

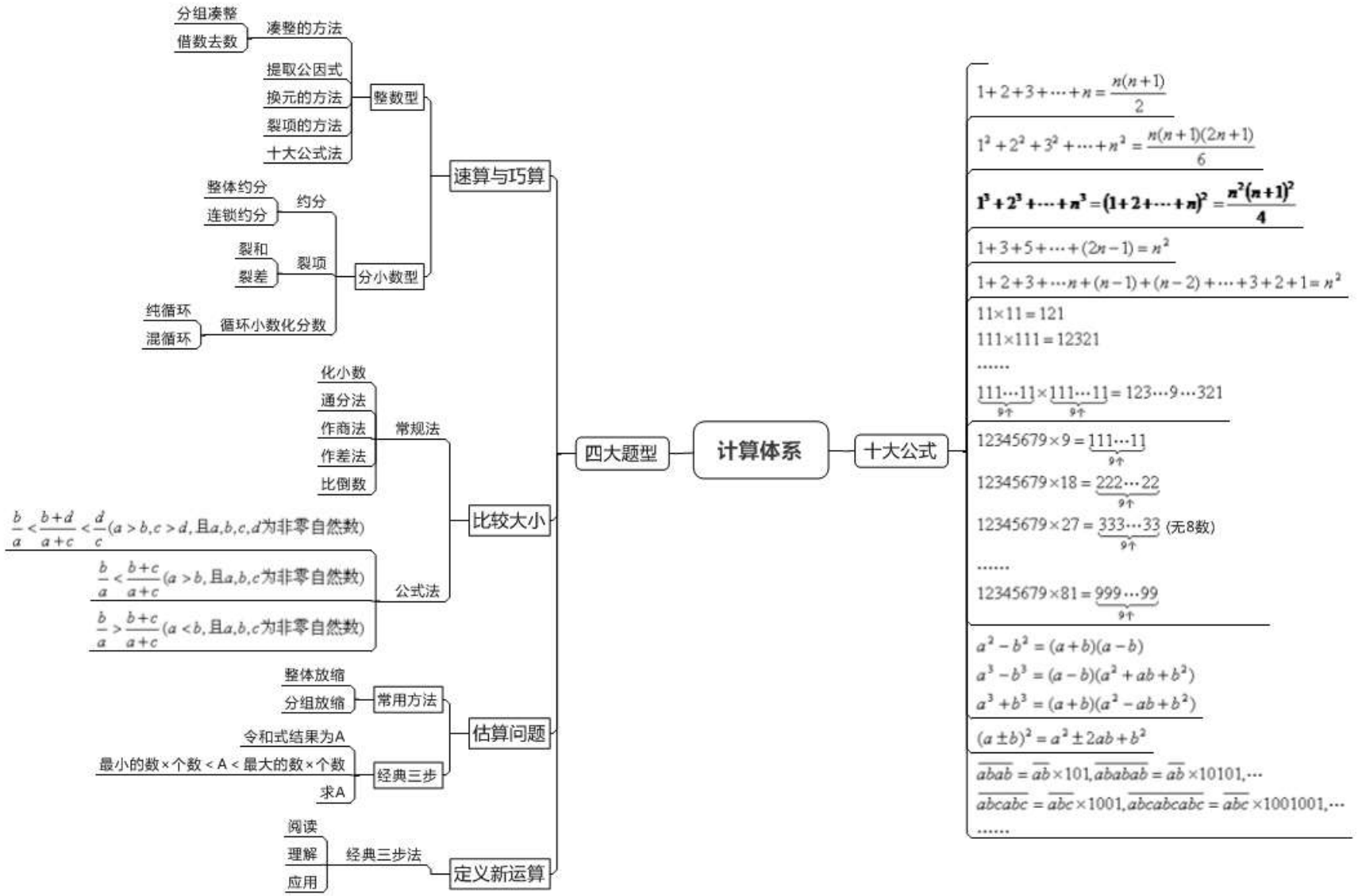
Transformation



What is MO?


应用题体系
经济问题
利润问题
利润=售价-成本
售价=成本×（1+利润率）
利润率=利润/成本×100%=售价-成本/成本×100%
折扣问题
售价=原价×折扣
利息问题
利率=利息/本金×100%
利息=本金×利率×期数
税收问题
上交税收=应纳税收入×税率
保险问题
保险费=保险金额×保险费率×保险期限
浓度问题
溶液重量=溶质重量+溶剂重量
=溶质重量÷浓度
浓度变化（溶质不变）
溶质重量=溶液重量×浓度
溶剂重量=溶液重量-溶质重量
=溶液重量×（1-浓度）
浓度=溶质质量/溶液质量×100%
类浓度问题（溶剂不变）
方程法
两种溶液混合
十字交叉法
工程问题
简单工程问题
工作效率×工作时间=工作总量
甲功效+乙功效=甲乙合作功效之和
复杂工程问题
周期性问题
实际问题
工程与行程综合
转化为行程问题
v=s/t
两人工程问题
二元一次方程
交替工作问题
分组法
分组，求一组内的合效率，设为A
工作总量设为1,1/A的结果取整
剩下的工作具体分配
牛吃草问题
“五步法”
简单牛吃草问题（以草为准）
求出两个总量
总量=时间差×每天长草量-安排去吃新草的牛数
每天长草量×天数=总共长出来的草
草的总量-总共长出来的草=原有的草
原有的草÷吃原有草的牛=能吃多少天
（或，原有的草÷能吃多少天=吃原有草的牛）
复杂牛吃草问题（以牛为准）
变例
抽水问题
人口问题
和差倍问题
和差问题
（和-差）÷2=较小数
（和+差）÷2=较大数
和倍问题
和÷（倍数+1）=较小数
和-较小数=较大数
差倍问题
差÷（倍数-1）=较小数
差+较小数=较大数
年龄问题
实质
和差倍问题
思想
年龄差不变
年龄的倍数变化
植树问题
直线型
两端都种树
棵数=段数+1=全长÷株距+1
全长=株距×（棵数-1）
株距=全长÷（棵数-1）
一端种树
棵数=全长÷株距
全长=株距×棵数
株距=全长÷棵数
两端都不种树
棵数=段数-1=全长÷株距-1
全长=株距×（棵数+1）
株距=全长÷（棵数+1）
封闭型
棵数=总距离÷株距
总距离=株距×棵数
株距=总距离÷棵数
方阵问题
列数相同：每边人数=四周人数÷4+1
列数不同：找规律
鸡兔同笼问题
四大题型
已知鸡兔数量差及足数，求鸡兔各有多少
已知鸡兔头与足的数量，求鸡兔各有多少
百兽分馒
变例
假设法
全鸡法
全兔法
砍足法
盈亏问题
盈亏型：（盈+亏）÷份额变化=人数
盈盈型：（盈-盈）÷份额变化=人数
亏亏型：（亏-亏）÷份额变化=人数
分数与百分数
量率对应
差额法/求和法
转化“1”
以不变量为1
以联系较多的量为1
倒推法

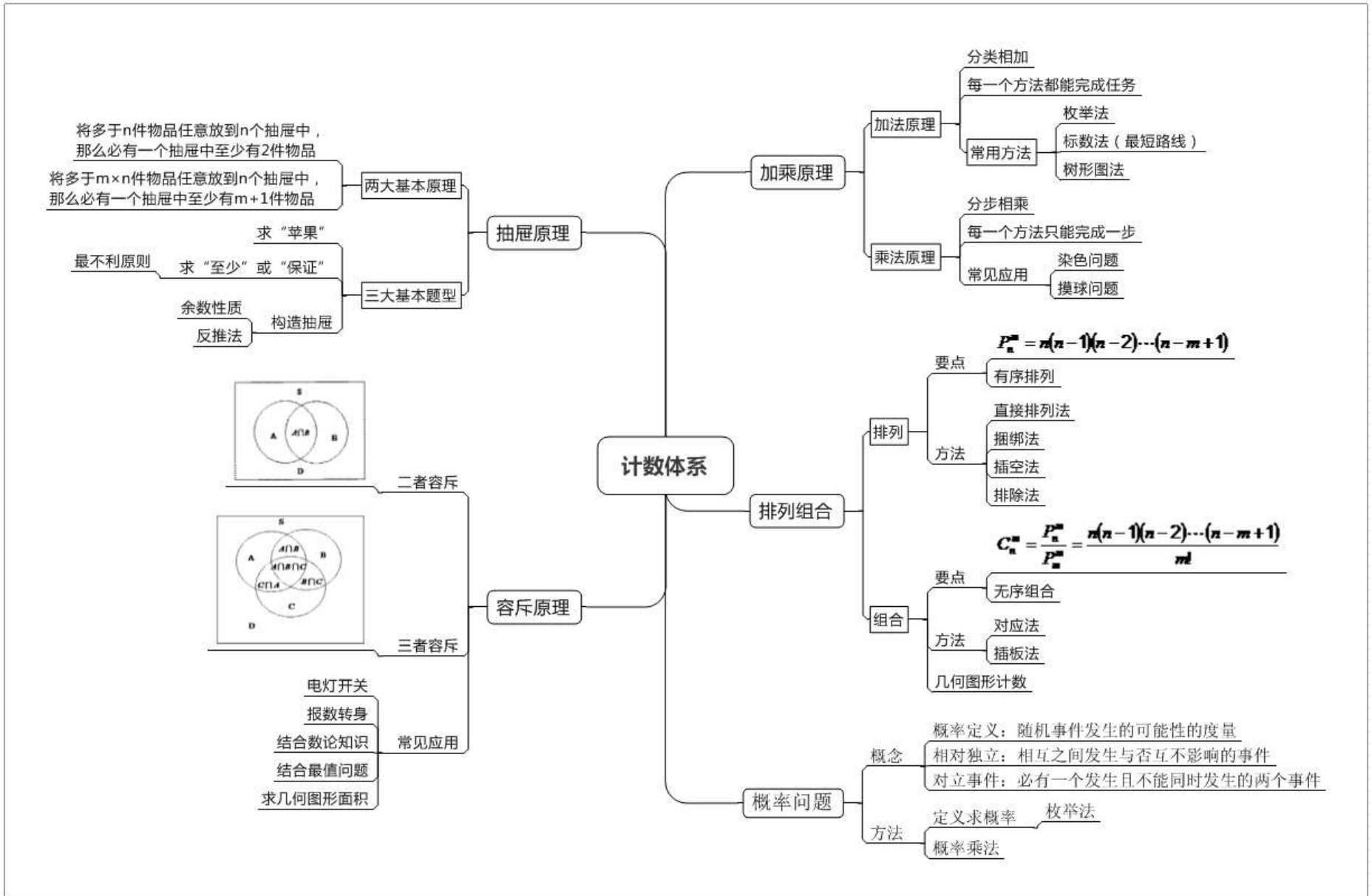
What is MO?


计算体系
四大题型
速算与巧算
整数型
凑整的方法
分组凑整
借数去数
提取公因式
换元的方法
裂项的方法
十大公式法
分小数型
约分
整体约分
连锁约分
裂项
裂和
裂差
循环小数化分数
纯循环
混循环
比较大小
常规法
化小数
通分法
作商法
作差法
比倒数
公式法
$\frac{b}{a}<\frac{b+d}{a+c}<\frac{d}{c}(a>b,c>d,$且$a,b,c,d$为非零自然数)
$\frac{b}{a}<\frac{b+c}{a+c}(a>b,$且$a,b,c$为非零自然数)
$\frac{b}{a}>\frac{b+c}{a+c}(a<b,$且$a,b,c$为非零自然数)
估算问题
常用方法
整体放缩
分组放缩
经典三步
令和式结果为A
最小的数×个数 < A < 最大的数×个数
求A
定义新运算
经典三步法
阅读
理解
应用
十大公式
$1+2+3+\cdots+n=\frac{n(n+1)}{2}$
$1^2+2^2+3^2+\cdots+n^2=\frac{n(n+1)(2n+1)}{6}$
$1^3+2^3+\cdots+n^3=(1+2+\cdots+n)^2=\frac{n^2(n+1)^2}{4}$
$1+3+5+\cdots+(2n-1)=n^2$
$1+2+3+\cdots n+(n-1)+(n-2)+\cdots+3+2+1=n^2$
$11\times11=121$
$111\times111=12321$
.....
$\underbrace{111\cdots11}_{9个}\times\underbrace{111\cdots11}_{9个}=123\cdots9\cdots321$
$12345679\times9=\underbrace{111\cdots11}_{9个}$
$12345679\times18=\underbrace{222\cdots22}_{9个}$
$12345679\times27=\underbrace{333\cdots33}_{9个}$ (无8数)
.....
$12345679\times81=\underbrace{999\cdots99}_{9个}$
$a^2-b^2=(a+b)(a-b)$
$a^3-b^3=(a-b)(a^2+ab+b^2)$
$a^3+b^3=(a+b)(a^2-ab+b^2)$
$(a\pm b)^2=a^2\pm2ab+b^2$
$\overline{abab}=\overline{ab}\times101,\overline{ababab}=\overline{ab}\times10101,\cdots$
$\overline{abcabc}=\overline{abc}\times1001,\overline{abcabcabc}=\overline{abc}\times1001001,\cdots$
.....

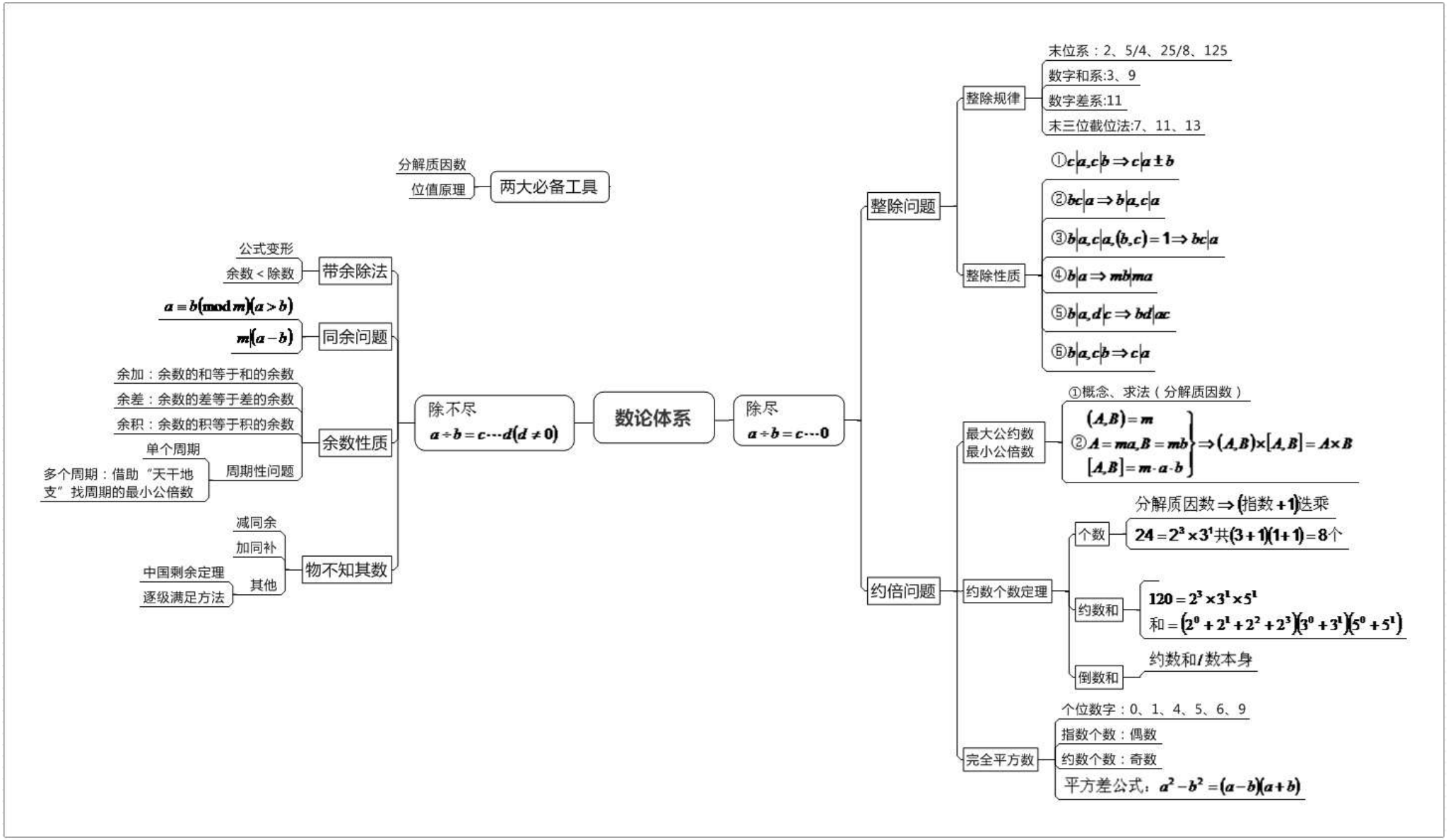
What is MO?

行程体系
九大题型（1）
复杂相遇追及
简单相遇
路程和=速度和×相遇时间
简单追及
路程差=速度差×追及时间
猫狗追兔
已知猫狗和兔步长的比例关系
两次设数法：①设单位时间，得出每秒几步；②设步长，从而得出各自速度
已知猫狗和兔的步长
设数法，将猫狗与兔的速度统一
解题思想
将两种动物单位化为统一
多次相遇追及
由相遇点求全程
3次以内：画图，用结论
3次以上：猫族法
求相遇次数
柳卡图（折线图）
运用倍比关系解题
几个全程
路程差
多人相遇追及
多人从两地出发（相遇或追及）
多人从同一地出发（追及）
分解为简单相遇追及来解决
九大题型（2）
火车过桥
完全过桥
火车车长+桥长=火车速度×通过时间
完全在桥
火车车长-桥长=火车速度×通过时间
火车+树
火车车长=火车速度×通过时间
火车+人
相向而行（相遇）：车长=（火车速度+人的速度）×错车时间
同向而行（追及）：车长=（火车速度-人的速度）×追及时间
火车+火车
超车问题
追及问题，画线段图找路程差
快车车长+慢车车长=（快车速度-慢车速度）×超车速度
错车问题
相遇问题，对方车长为路程和
对方车长=（快车速度+慢车速度）×错车速度
发车问题
一车出发到下一车出发：汽车间距=汽车速度×发车间隔
人、车相向行驶：汽车间距=（汽车速度+人的速度）×相遇时间
人、车同向行驶：汽车间距=（汽车速度-人的速度）×相遇时间
流水、扶梯问题
流水问题
逆水速度=船速-水速，顺水速度=船速+水速
船速=（顺水速度+逆水速度）÷2，水速=（顺水速度-逆水速度）÷2
性质：河流中漂流物体速度=水流速度
结论：流水行船中的相遇追及问题与水速无关
扶梯问题
“单位时间走了多少级台阶”对应“船速”
“单位时间运动了多少米”对应“顺水速度或者逆水速度”
顺行速度=正常行走速度+扶梯运行速度
逆行速度=正常行走速度-扶梯运行速度
扶梯长度=人速×顺向时间÷梯速×顺向时间
或者：扶梯长度=人速×逆向时间-梯速×逆向时间
时钟问题
基本思路
封闭路线上的追及问题
关键问题
确定分针、时针的初始位置
确定分针、时针的路程差
基本方法
分格方法：分针速度=1格每分钟，时针速度=1/12格每分钟
度数方法：分针速度=6度每分钟，时针速度=0.5度每分钟
九大题型（3）
变速变道
接送问题
车速不变，人速相等
车空载、满载速度不等，人速相等
车速不变，人速成比例
车空载、满载速度不等，人速成比例
平均速度
两段路程，时间相同：$v=\frac{v_1+v_2}{2}$
两段路程，距离相同：$v=\frac{2v_1v_2}{v_1+v_2}$
没数法
变速运动
两车速度分别变化
一车行进中速度变化
环形跑道变速运动
变道问题
注意两人行驶总路程
多人相遇通过时间对比分析路径，得到相遇点大概位置
走走停停
一个周期时间=行走时间+休息时间
画图，确定相遇路段
不等式的解法
解题工具
找各等量关系，用方程解题
画线段图
部分路段变速，只关注变速路段
比例知识
份数思想
六大方法
公式法
包括行程基本公式、相遇公式、追及公式、流水行程公式、火车过桥公式等，不仅要注意公式的原形，也要注意公式的各种变形形式
图示法
在折返、相遇、追及的地点、多次相遇、追及问题等复杂行程问题中的常用方法，包括线段图、折线图和列表
比例法
行程问题中有很多比例关系，在只知道和差、比例时，用比例法可求得具体数值。在没有具体数值的情况下，只能用比例解题
分段法
在分段变速的行程问题中，公式不能直接适用。这时通常把不匀速的运动分为匀速的几段，在每一段中用匀速问题的方法去分析
方程法
在关系复杂、条件分散的题目中，设条件关系最多的未知量为未知数，抓住重要的等量关系列方程常常可以顺利求解。
假设法
行程问题中的常用方法，一般假设某一变量并未发生变化
线段图
不同人用不同颜色表示
不同时间用不同线型
标上方向和数据

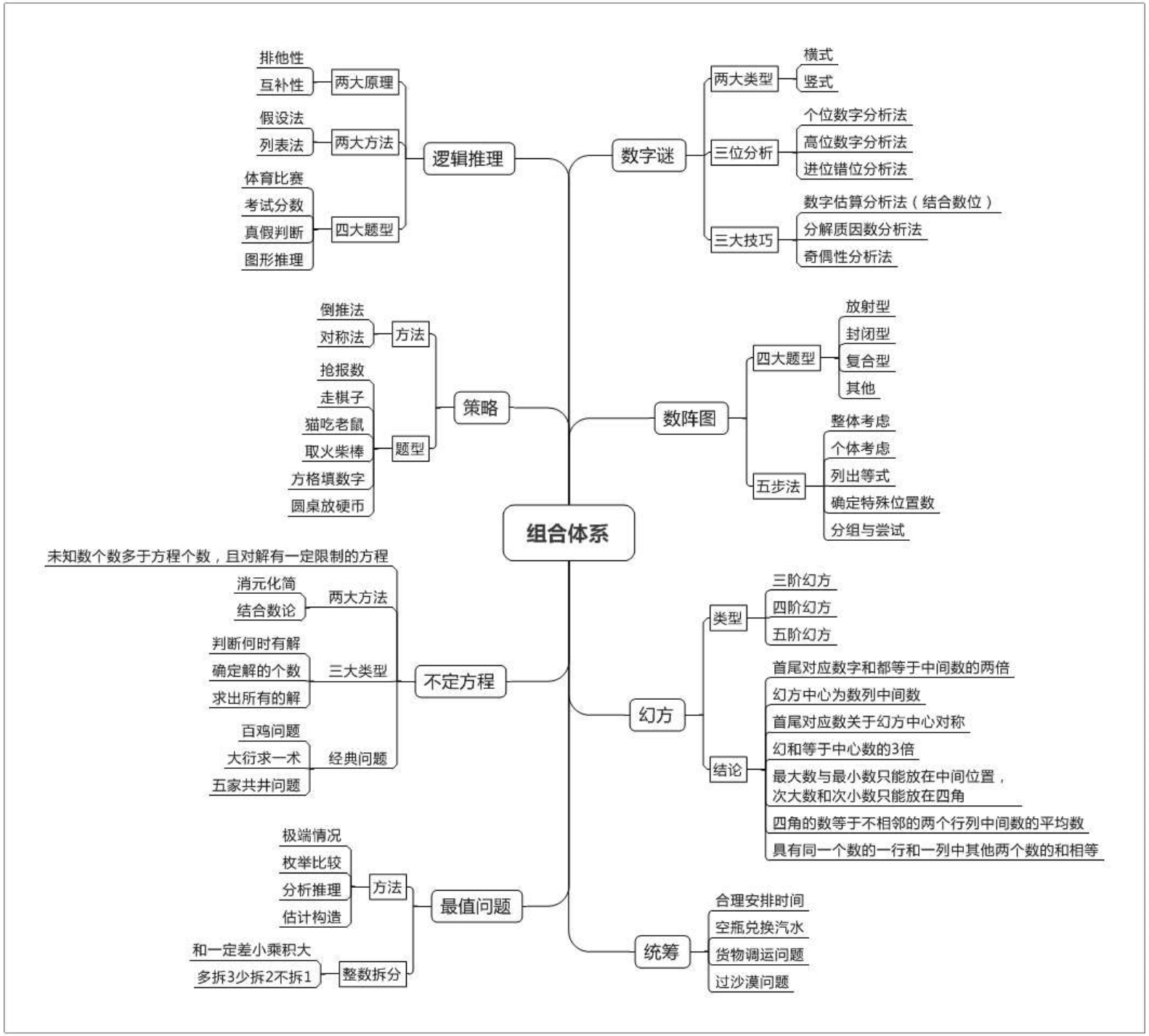
What is MO?


计数体系
抽屉原理
两大基本原理
将多于n件物品任意放到n个抽屉中，那么必有一个抽屉中至少有2件物品
将多于m×n件物品任意放到n个抽屉中，那么必有一个抽屉中至少有m+1件物品
三大基本题型
求“苹果”
最不利原则
求“至少”或“保证”
余数性质
反推法
构造抽屉
容斥原理
二者容斥
三者容斥
常见应用
电灯开关
报数转身
结合数论知识
结合最值问题
求几何图形面积
加乘原理
加法原理
分类相加
每一个方法都能完成任务
常用方法
枚举法
标数法（最短路线）
树形图法
乘法原理
分步相乘
每一个方法只能完成一步
常见应用
染色问题
摸球问题
排列组合
排列
要点
有序排列
$P_n^m = n(n-1)(n-2)\cdots(n-m+1)$
方法
直接排列法
捆绑法
插空法
排除法
组合
要点
无序组合
$C_n^m = \frac{P_n^m}{P_m^m} = \frac{n(n-1)(n-2)\cdots(n-m+1)}{m!}$
方法
对应法
插板法
几何图形计数
概率问题
概念
概率定义：随机事件发生的可能性的度量
相对独立：相互之间发生与否互不影响的事件
对立事件：必有一个发生且不能同时发生的两个事件
方法
定义求概率
枚举法
概率乘法

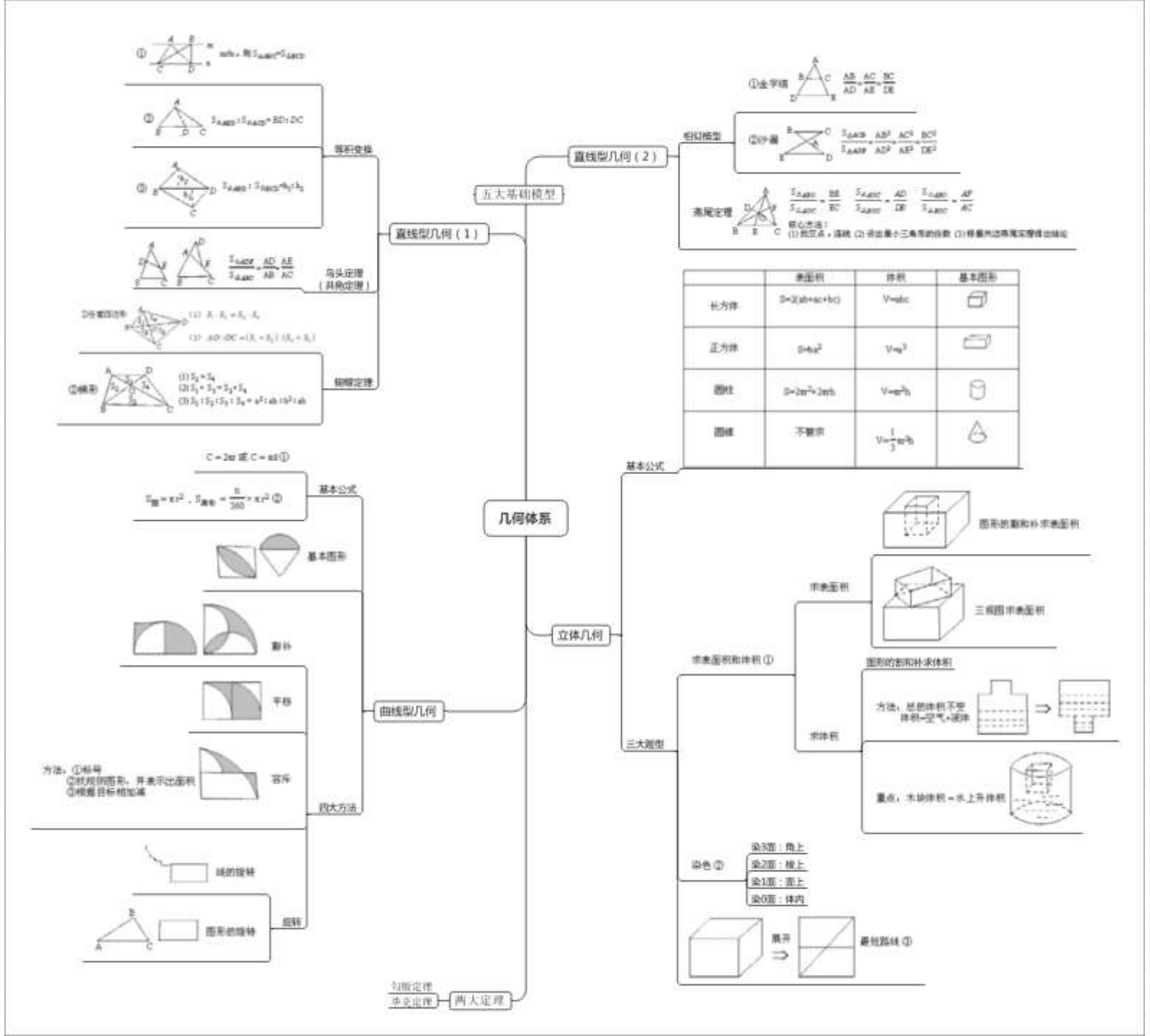
What is MO?


数论体系
两大必备工具
分解质因数
位值原理
除不尽
$a \div b = c \cdots d (d \neq 0)$
带余除法
公式变形
余数＜除数
同余问题
$a = b (\mathrm{mod}\ m)(a > b)$
$m | (a-b)$
余数性质
余加：余数的和等于和的余数
余差：余数的差等于差的余数
余积：余数的积等于积的余数
周期性问题
单个周期
多个周期：借助“天干地支”找周期的最小公倍数
物不知其数
减同余
加同补
其他
中国剩余定理
逐级满足方法
除尽
$a \div b = c \cdots 0$
整除问题
整除规律
末位系：2、5/4、25/8、125
数字和系:3、9
数字差系:11
末三位截位法:7、11、13
整除性质
①$c|a, c|b \Rightarrow c|a \pm b$
②$bc|a \Rightarrow b|a, c|a$
③$b|a, c|a, (b,c)=1 \Rightarrow bc|a$
④$b|a \Rightarrow mb|ma$
⑤$b|a, d|c \Rightarrow bd|ac$
⑥$b|a, c|b \Rightarrow c|a$
约倍问题
最大公约数
最小公倍数
①概念、求法（分解质因数）
$\left.\begin{array}{l}(A,B)=m \\ ②\ A=ma, B=mb \\ [A,B]=m \cdot a \cdot b\end{array}\right\} \Rightarrow (A,B) \times [A,B] = A \times B$
约数个数定理
分解质因数 $\Rightarrow$ (指数+1)连乘
个数
$24 = 2^3 \times 3^1$ 共 $(3+1)(1+1)=8$ 个
约数和
$120 = 2^3 \times 3^1 \times 5^1$
和 $= (2^0+2^1+2^2+2^3)(3^0+3^1)(5^0+5^1)$
倒数和
约数和/数本身
完全平方数
个位数字：0、1、4、5、6、9
指数个数：偶数
约数个数：奇数
平方差公式：$a^2-b^2=(a-b)(a+b)$

What is MO?


组合体系
逻辑推理
两大原理
排他性
互补性
两大方法
假设法
列表法
四大题型
体育比赛
考试分数
真假判断
图形推理
数字谜
两大类型
横式
竖式
三位分析
个位数字分析法
高位数字分析法
进位错位分析法
三大技巧
数字估算分析法（结合数位）
分解质因数分析法
奇偶性分析法
策略
方法
倒推法
对称法
题型
抢报数
走棋子
猫吃老鼠
取火柴棒
方格填数字
圆桌放硬币
数阵图
四大题型
放射型
封闭型
复合型
其他
五步法
整体考虑
个体考虑
列出等式
确定特殊位置数
分组与尝试
不定方程
未知数个数多于方程个数，且对解有一定限制的方程
两大方法
消元化简
结合数论
三大类型
判断何时有解
确定解的个数
求出所有的解
经典问题
百鸡问题
大衍求一术
五家共井问题
幻方
类型
三阶幻方
四阶幻方
五阶幻方
结论
首尾对应数字和都等于中间数的两倍
幻方中心为数列中间数
首尾对应数关于幻方中心对称
幻和等于中心数的3倍
最大数与最小数只能放在中间位置，
次大数和次小数只能放在四角
四角的数等于不相邻的两个行列中间数的平均数
具有同一个数的一行和一列中其他两个数的和相等
最值问题
方法
极端情况
枚举比较
分析推理
估计构造
整数拆分
和一定差小乘积大
多拆3少拆2不拆1
统筹
合理安排时间
空瓶兑换汽水
货物调运问题
过沙漠问题

What is MO?


几何体系
五大基础模型
直线型几何（1）
等积变换
鸟头定理（共角定理）
蝴蝶定理
直线型几何（2）
相似模型
①金字塔
②沙漏
燕尾定理
曲线型几何
基本公式
基本图形
割补
平移
容斥
四大方法
线的旋转
图形的旋转
旋转
两大定理
勾股定理
毕达哥拉斯定理
立体几何
基本公式
长方体
正方体
圆柱
圆锥
三大题型
求表面积和体积①
求表面积
图形的割和补求表面积
三视图求表面积
求体积
图形的割和补求体积
方法：总的体积不变
体积=空气+液体
重点：木块体积=水上升体积
染色②
染3面：角上
染2面：棱上
染1面：面上
染0面：体内
展开
最短路线③

Content

计算	计数	几何	数论	行程	应用题	杂题
整数巧算	基础枚举法	巧求周长	奇数与偶数	初识行程	平均数	逻辑推理
认识分数	标数法	正方形与长方形	带余除法	相遇问题	归一问题	体育比赛中的数学
等差数列	数图形	线与角	因数和倍数	追及问题	鸡兔同笼	数阵图
方程	整数分拆	平行四边形与梯形	质数与合数	火车过桥	周期问题	数字谜
认识小数	加乘原理	三角形	位值原理	环形跑道	盈亏问题	最不利原则
十大公式	容斥原理	等积变形	分解质因数	流水行船	和差倍问题	最值问题
小数巧算	排列组合	等高模型	整除特征	多次相遇与多次追及	方阵问题	操作类智巧趣题
定义新运算		图形变换技巧	完全平方数	钟面行程	年龄问题	统筹与规划
分数乘除		一半模型	余数特征	电梯与发车	页码问题	必胜策略
分数加减		格点与割补	末几位数字问题	走走停停	还原问题	归纳与递推
分数巧算		相似模型与蝴蝶模型	神奇的进位制	比例法解行程	方程法解应用题	抽屉原理
数表		弦图与勾股定理	弃九法	接送问题	基本分数应用题	构造与论证
分数裂项与整数裂项		立体图形	同余模型	柳卡图	比例应用题	
比较与估算		三视图与展开图	同余方程	方程法解行程	工程问题	
		鸟头模型	韩信点兵		牛吃草	
		风筝模型	孙子定理		经济问题	
		燕尾模型	不定方程		浓度问题	
		圆与扇形				
		切片与染色				
		水中浸物				
		旋转与轨迹				
		圆柱与圆锥				

颜色说明：

第1阶段
第2阶段
第3阶段

How to excel in learning MO

1.Building a knowledge system

How to excel in learning MO

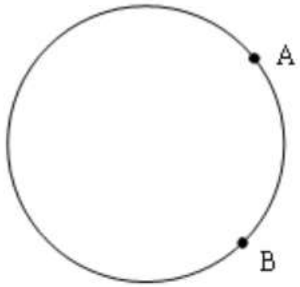
1.Building a knowledge system

P5: Clock travel

26. From 5:00 a.m. to 12:00 noon of the same day, how many times will the minute and the hour hand form an angle of 120°?

P4: Circular racetrack

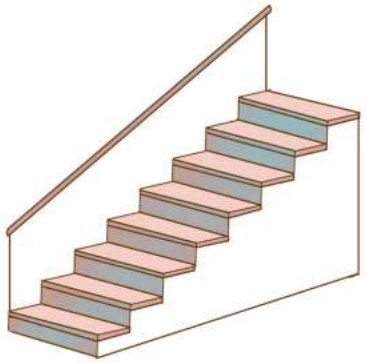
1．（3 points）As shown in the figure below, it is an 800 metre circular runway of the school, of which two points A and B are 200 metres apart. Alex and Ben start from point A and B respectively at the same time. Alex runs 6 metres per second and Ben runs 4 metres per second, both running counterclockwise. How long will it take Alex to catch up with Ben for the first time?



How to excel in learning MO

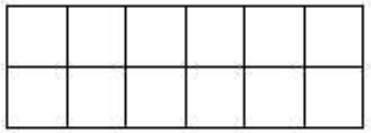
2. Understand the principle

A staircase with 8 steps requires only 1 or 2 steps to be taken at a time. How many different ways are there



2019-NMOS-R2-Q14

14. Find the total number of ways to pave a 2×6 block with 6 tiles of the size 1×2, assuming tiles of the same size are indistinguishable.



How to excel in learning MO

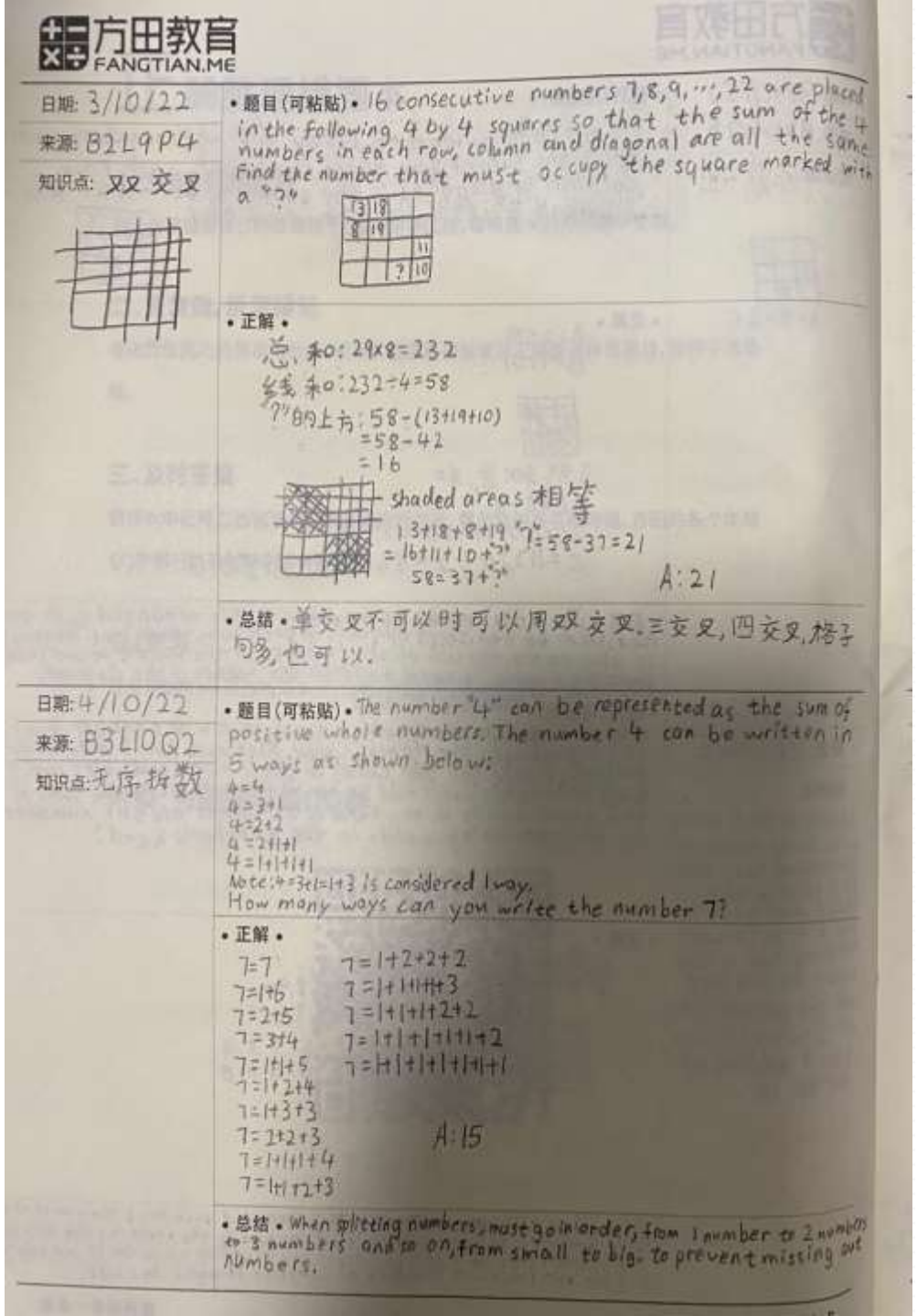
3. Practice

(1) Persistence in practicing

How to excel in learning MO

3. Practice

(2) Incorrect questions > New questions



Teachers

KANGAROO.STUDY老师简介

Teacher Cao Kenan:

Gold medal coach from the Chinese Math. Olympiad. His students make up 50% of the current Anhui provincial team, in which 5 of them have won the gold medal in CMO. Teacher Cao is our headmaster and the main coach of our Exploration class. From his class of 16 students in 2022, 4 won the gold medal and 8 won the silver medal of NMOS. Among them, 1 has taken part in IMSO team and was ranked 1st in Asia. 2 of his secondary school students also joined the senior training team.

Teaching style:

Passionate teaching that inspire students to strive for excellence. Maintain an engaging classroom.

Teacher Wang Tong:

Graduate of Nanyang Technologial University with a major in Mathematics and Economics. CN Yang Scholar. Good at nurturing students' interest in learning mathematics and step by step guiding the student to reach mastery and independent application of what is learned.

Teaching style:

Devoted to provoke students' interest and develop good learning habits.

Teacher Chia Ka Jin Cedric:

Graduate of the University of Western Australia with a double major in physics and math. Served as research assistant for Quantum and Laser Science Lab at the University of Malaya. With years of experience on teaching mathematics, Teacher Xie is capable of breaking down complex problems and deliver them to students in simple terms.

Teaching style:

Committed to help student grow a love for learning mathematics. Always keeping a positive atmosphere in class.

Teachers

KANGAROO.STUDY老师简介

Teacher Zhang Tao:

Graduate of the Huazhong University of Science and Technology. S-rank teacher from Fang Tian Edu. and was promoted to lead teacher of Primary Math in 1 year time. Teacher Zhang is familiar with the Primary Olympiad Math framework and all kinds of math contests. He has helped many students won the gold medal in YingChun Cup (equivalent to RIPMWC).

Teaching style:

Focus on cultivating mathematical thinking and good learning habits. Maintain a lively atmosphere in the class.

Teacher Cui Jiaming:

Graduate of Wuhan University, youngest S-rank teacher from Fang Tian Edu. and was ranked top 3 in teaching statistics since 2021 among 200+ teachers. Teacher Cui is well recognized by students and parents. He is acquainted with the Primary Olympiad Math structure and has adaptive teaching style. Many of his students have won the YingChun Cup (equivalent to RIPMWC).

Teaching style:

Devoted to broaden students' horizon and help them achieve their goals.

Teacher Gao Xuming:

Graduate of Wuhan University. S-rank teacher from Fang Tian Edu. Teacher Gao is our lead teacher of the Primary Math Department, and he oversees the quality of the Primary Olympiad Math teaching material. He is also familiar with the latest Primary Math. Olympiad questions design. He has helped many students achieved their goal including winning gold medal in Yingchun Cup (equivalent to RIPMWC).

Teaching style:

Balanced between integrating dynamics teaching and conducting didactic instruction.

Contact me

Let's work together!