推荐生应考知识点大全

作者：2019 级 21 班 杨冠中

如有问题请加 QQ：3172744881

目录

第零部分·各科相关书单推荐

语文相关书单

①必修课本

（**重点关注文言文注释即可**，有能力可了解字词读音（字词多为中考提高，少有超纲））

②高考语文核按钮

（造字法方面特别详细，但在语法方面有点鸡肋，**不建议为了一道造字题而购买**）

③名著

（以下根据考过的次数分级：**一级：三国演义、红楼梦。二级：莎士比亚相关。三级：水浒传、老人与海。**四级：茶花女、巴黎圣母院、唐吉坷德、聊斋志异、平凡的世界、简爱、草房子、史记、诗经、朝花夕拾。**建议了解前三级**）

数学相关书单

①必修课本

（**重点超纲考点：均值不等式（21 年现学题+每年正常题都会涉及）、概率（每年正常题都会涉及）。**易考超纲考点：向量**（22 年现学题）**、三角函数、立体几何、一元二次不等式、等差等比数列）

（**有能力可用根据 b 站 up“一数”的网课进行学习**，若时间紧迫可直接看汇 X 集合）

②汇 X 集合

英语相关书单

①必修课本

（**推荐生词汇很大比例都是高中词汇，尤其是必修一二词汇**，有时间就往前背，背完之后听写，**做到英汉翻译无障碍。最少学完必修一词汇**）

（**必修一的课文和习题必须过一遍**，22 年考了必修一第五单元的课文习题原题）

（可以的话再多了解一些动词搭配（见附））

②好句好段模板

（已附带提供）

（**初高中均可，要含有当下时政热点和中国精神的内涵，方便升华扣大帽子**）

（口语要求在 2 分钟内思考并说完，**有模板之后直接套用即可**）

（**22 年口语试题：你为什么选择济外（自我介绍），如何看待浪费（传统美德），你更像母亲还是父亲（传统美德、写人）**）

物理相关书单

①必修课本

（**重点超纲考点：超重失重、力的分解**）

（**有能力可用根据 b 站 up“黄夫人”的网课进行学习**，若时间紧迫可直接看考前冲刺整理）

第一部分·笔试知识点整理

语文杂项整理

1. 词类活用

①**使动用法：不修饰主语而描述宾语。**

②**意动用法：主语认为（或以为）宾语怎么样。**

2. 标点符号

①问号：有几个回答就有几个问号（当突出每一个选项且选项较多时，可都用问号）。问号要放在最后**（仅限倒桩句，疑问词除外）。前有双面词，不用问号。**

②引号：**直接引用（XXX 说：“XXXXX。”）和间接引用（XXX 说的“XXXXX”。/XXX 说，XXXXX）。表示需要着重论述的对象。特定称谓。表讽刺/否定。**

③书名号：用于各类**用文字/声音/图像等表现的作品**的名称。

④顿号、逗号、分号

(1) 顿号和逗号：**并列成分用逗号。**表示概数/不停顿无歧义的词不能用顿号。并列成分间有语气词/强调不用顿号用逗号。**标有引号或标有书名号的并列成分之间通常不用顿号。**

(2) 逗号和分号：单句排比用逗号，不用分号。并列关系句用逗号，不用分号。**句子中没有逗号，不能直接用分号。**

⑤冒号：一包到底（包含/总结/解释说明），**且后不能加“即”“乃”“是”。**

⑥破折号：补充/解释说明。**一个句子当中不能出现两个“冒号”。**

⑦省略号：**不能与“等”同时出现。**前后均可加逗号/感叹号/问号**（有后文可以，无后文不可）**。表示说话的断断续续。

【注：

省略号前加符号：省略号前的句子表示强烈语气、句末使用问号或叹号时。

省略号前不用点号就无法标示停顿或表明结构关系时。

省略号后加符号：当句末表达强烈的语气或感情时，可在省略号后用问号或叹号。

当省略号后还有别的话、省略的文字和后面的话不连续且有停顿时，应在省略号后用点号。

当表示特定格式的成分虚缺时，省略号后可用点号。】

⑧括号：**应紧挨被解释的词句。**

3. 易考文化常识

(1) 造字法

①象形→形状**（从图而来，没有偏旁的一定是象形或指事）**

②指事→象形+指义符**（从象形的基础上加笔画表示动作，没有偏旁的一定是象形或指事）**

③会意→两个或两个以上的字合在一起

④形声→形部+声部**（可以读半边的都是形声）**

(2) 四字词语分析：

①**联合词：AB+CD，其中 AB 与 CD 的结构相同。**

②**动宾：A+B=动词+宾语。偏正：A+B=形容词+名词。主谓：A+B=主语+动词。**

(3) 句子层级：

修饰 A 修饰 B 修饰 B 修饰 D

①**如果 B 修饰 A，则 AB 为一个层次，可以重复套娃，整个句子是第一层，然后往下延伸。**

②层次之间的关系有：并列、递进（承接）、选择、转折、因果、条件、假设。

(4) 短语中词：**短语是由词语组成的，所以说一个字有可能是一个词。**

(5) 短语顺序：**领属地+时间地点+数量+动作性短语+形容词+名词**

(6) 名词定语：**观察有无“那”“这”等单个字**

(7) **忆江南 27 字；如梦令 33 字；浣溪沙 42 字；菩萨蛮 44 字；卜算子 44 字；采桑子 44 字；清平乐 46 字 ；太常引 49 字；一剪梅 60 字；渔家傲 62 字；定风波 62 字；青玉案 67 字；江城子 70 字；满江红 93 字；水调歌头 95 字；念奴娇 100 字**

(8) 科举制（院试-乡试-会试-殿试）

①**院试（县级别的考试）**

未考中前叫“童生”。考中后称“秀才”“生员”。

②**乡试（地方上省级别的考试）**

每三年考一次，考期在秋季八且，**故又称秋闱。**参考者秀才，**及格者称举人，俗称孝廉，第一名称解元。**

③**会试（全国级别的考试）**

是在乡试的基础上开展的。时间是在乡试的第二年春天，**故称春闱**；地点京城礼部官衙，由礼部主持，**故又称“礼闱”。考中后称“贡士”，俗称出贡，别称明经，第一名叫“会元”。**

④殿试在会试后当年举行，由皇帝亲自主持考试，只考时务策一道。

录取分三甲：

一甲三名，赐进士及第，第一名称状元、鼎元，二名榜眼，三名探花，合称三鼎甲。

二甲赐进士出身，三甲赐同进士出身。二、三甲第一名皆称传胪。

一、二、三甲统称进士。

进士榜称甲榜，或称甲科。进士榜用黄纸书写，故叫黄甲，也称金榜，中进士称金榜题名。

(3) 爵位：**公（也做敬辞，注意区分）**，候，伯，勋，男

(4) 四大悲剧：**《哈姆雷特》《奥赛罗》《李尔王》《麦克白》**

(5) 四大喜剧：**《威尼斯商人》《仲夏夜之梦》《皆大欢喜》《第十二夜》**

(6) 四大吝啬鬼：**夏洛克（英·莎士比亚《威尼斯商人》），阿巴贡（法·莫里哀《吝啬鬼》），葛朗台（法·巴尔扎克《欧也妮·葛朗台》），泼留希金（俄·果戈理《死魂灵》）**

4. 现代文：**易错概念易偷换。**
5. 诗歌：**情感**、**手法**、抒发感情&描述景物事件、**翻译**、诗人
6. 文言文：**直接体现品质时从别人口中说出来的不可以。**
7. **重点字词见附。**

数学方法整理

1. 极限

易考：**极大，极小，平均 。**

提示：不要浪费时间。

考题：【推荐生 2010,5】【推荐生 2017,33】【推荐生 2020,7】

2. 目测及设数

易考：①**图像题设单位 1。**

②计算题未知数比大小**直接按不等式或选项设未知数大小，**

③计算题**未知数比大小数形结合分类讨论。**

提示：不要浪费时间。

考题：【推荐生 2012,8】【推荐生 2015,2】【推荐生 2015,8】【推荐生 2018,23】【推荐生 2020,2】【推荐生 2020,7】【推荐生 2020,12】【推荐生 2021,5】【推荐生 2021,7】【推荐生

2021,8】【推荐生 2021,11】【推荐生 2021,12】【推荐生 2021,14】【推荐生 2021,18】【省招 2019,3】【省招 2019,17】【省招 2019,20】

3. 证明

易考：选项答案明显且易证明的题**直接证明**，图形题求角度长度直接**画图证明。**

提示：不要浪费时间。

考题：【推荐生 2017,32】【推荐生 2017,35】【推荐生 2020,1】【推荐生 2020,10】【推荐生 2020,14】【推荐生 2020,17】【推荐生 2021,18】【省招 2011,7】【省招 2012,5】【省招 2019,1】【省招 2019,10】【省招 2019,13】【省招 2019,21】【省招 2019,22】

4. 转换法

易考：将题目已知量转换成有效信息。

提示：①实际生活题易考。

②**折叠转化为等边等角，延长边勾股定理。**

③**寻找固定关系。**

④**|m-a| 化为 x=m 时到 x=a 的距离。**

考题：【推荐生 2014,8】【推荐生 2020,5】【推荐生 2020,18】【推荐生 2021,2】【省招 2012,3】【省招 2012,6】【省招 2013,2】【省招 2013,4】【省招 2013,9】【省招 2013,12】【省招 2014,6】【省招 2014,13】【省招 2014,14】【省招 2015,8】【省招 2015,9】【省招 2015,14】【省招 2015,15】【省招 2015,19】【省招 2016,16】【省招 2018,10】【省招 2019,6】【省招 2019,15】

5. 整体带入

易考：将**共同部分同加同减。关注重复组。**

提示：**重复图形的拼接。**

考题：【推荐生 2016,7】【推荐生 2019,25】【推荐生 2019,27】【推荐生 2019,37】【推荐生 2019,39】【省招 2014,16】【省招 2014,17】【省招 2015,14】【省招 2015,15】【省招 2018,8】

6. 十字交叉相乘

易考：①$(x+a)(x+b)=x^2+(a+b)x+ab$。

②$(a/b)=(c/d)=(a+c)/(b+d)$。

③$x+y\geqslant 2\sqrt{(xy)}$，$x^2+y^2\geqslant 2xy$，$((x+y)^2)/4\geqslant xy$。

提示：①有 x^2**与四项或三项**时尝试十字交叉，或**分数等式交叉相乘后再进行十字交叉。**

②**将等号右边内容归为左边。**

③**将 x 化为**$(\sqrt{x})^2$。

④**等式两边同+1。**

考题：【推荐生 2010,4】【推荐生 2013,5】【推荐生 2015,8】【推荐生 2020,6】【推荐生 2021,4】【推荐生 2021,15】

7. 找相同比不同及设数带入

易考：①在多元计算题中，将**已知量化为相似形势（分子、分母、某项相同）后将不同量设数进行比值带入，**算出比值后进行进一步**设数带入**或将其**整体带入**。

②或将**未知量与已知量分局等式两侧**，然后将**未知量化为要求量**后进行计算。

③**求最大值让减数最小，求最小值让加数最小。**

提示：①考试时不一定要算出每一个未知数。

②$(a/b)=(c/d)=((a+c)/(b+d))$。

③**a+b+c=z，则 a=z-(b+c)。**

考题：【推荐生 2012,9】【推荐生 2014,7】【推荐生 2015,4】【推荐生 2018,39】【推荐生 2019,32】

【推荐生 2019,34】【推荐生 2019,38】【推荐生 2020,7】【推荐生 2021,13】【推荐生 2021,17】【推荐生 2021,19】

8. 抛物线、二次函数及其运用

易考：①在抛物线有关问题中证明**存在性。**

②由**特殊点构成的特殊图形（等腰三角形、直角三角形）（在算出边长后用三边关系比求值）。**

③**特殊点同加减乘除比大小（关注形式及特殊位置的坐标）。**

提示：①**与 x 轴两交点之间的长度√(b²-4ac)/(|a|)，顶点到 x 轴距离 |((b²-4ac)/4a)|，O 与 y 轴交点之间的长度 |c|，两根之和-b/a，两根之积 c/a。**

②**直角三角形射影定理、勾股定理。**

考题：【推荐生 2015,10】【推荐生 2017,71】【推荐生 2018,25】【推荐生 2019,27】【推荐生 2020,16】【推荐生 2020,19】【推荐生 2020,20】【推荐生 2021,6】【省招 2011,11】【省招 2011,19】【省招 2012,11】【省招 2012,19】【省招 2018,6】

9. 圆及其应用

易考：**构造共圆，连圆心，做垂直，分类讨论。**

提示：①**题目中给的圆不一定是唯一圆。**

②**r○O 为△ABC 内接圆时，S△ABC=(C△ABC×r○O)/2。**

③**r○O 为 RT△ABC 内接圆且∠B=90°时，r○O=(AB+BC-AC)/2。**

④**S 扇=(lr)/2（l 为扇形周长，r 为扇形半径）。**

⑤**S 圆锥侧=l/2·2πr=πrl（l 为圆锥母线长，r 为圆锥地面半径，实质是 S 扇的变形）。**

考题：【推荐生 2014,9】【推荐生 2017,34】【推荐生 2020,14】【省招 2011,12】【省招 2011,18】【省招 2012,8】【省招 2012,13】【省招 2012,17】

10. 勾股定理

易考：**函数 y=√(a²+b²)+√((c-x)²+d²)最值。**

提示：**开方计算题求最值尝试画图用勾股定理。**

考题：【推荐生 2020,15】【省招 2016,11】

英语语法

1. 宾语从句

（1）**appreciate/depend on/(dis)like/love/enjoy/feel like/hate+it+宾语从句 或者 feel/find/think/make+it+adj+宾语从句。可以把 it 转化为 wh-词放于从句中，则不再需要 it 指代。**

（2）**介词后只能用特殊疑问词引导从句，但当 but/besides/except 表“除了”时，可以用 that。**

（3）**表示情感形容词后用 that 连接宾语从句。**

（4）宾语从句否定相关：

①反义疑问句时态与人称与从句保持一致**(如果从句中有否定含义，反义疑问句用肯定)**。

②否定转移不能转移的情况：主句疑问句或非否定从句中有否定含义。

（5）在表示劝告、命令、建议等含义的动词（demand/command/desire/maintain/urge/wish direct/arrange/suggest/order/insist/propose）后的表语从句，**谓语动词为（should）do（永为原型）。**但若 wish 是过去式，则从句不能用虚拟语气，可以用（should+）动词

原形或 would/might+动词原形，后者表有可能实现。

（6）连接词：

从句完整	that	可省略
从句缺是否	weather/if	只能用 weather 的情况：①在句首②**加 or not**③**介词之后**④**加不定式**⑤if 有歧义时⑥**be+adj 后**
从句缺人	who/whom	
从句缺物	what	
从句缺哪一个	which	
从句缺时间	when	
从句缺地点	where	
从句缺所属	whose	
从句缺怎样	how	

（7）从句顺序：**连接词+陈述句语序**

考题：【推荐生 2010,20】【推荐生 2012,5】【推荐生 2013,7】【推荐生 2014,6】【推荐生 2020,48】【推荐生 2020,49】【推荐生 2020,50】【推荐生 2020,96】【推荐生 2021,39】【省招 2009,23】【省招 2010,26】【省招 2013,33】【省招 2015,30】【省招 2016,35】【省招 2017,40】【省招 2017,55】【省招 2019,56】

2. 表语从句

（1）在表示劝告、命令、建议等含义的名词 (plan/advice/suggestion/order/proposal/idea) 后的表语从句，**谓语动词为（should）do（永为原型）(the+特殊词+of+事情+系动词+虚拟式表语从句)。**

（2）**注意它问的是啥。**

（3）连接词：

从句完整	that	不可省略
从句缺原因	because	**特殊情况：the reason of sth+that+从句**
从句缺是否	weather	不用 if
从句缺人	who	
从句缺物	what	
从句缺哪一个	which	
从句缺时间	when	
从句缺地点	where	
从句缺怎样	how	
从句缺“好像似乎”	**as,as if,as though**	**①常在 seem,appear,look,sound,feel 后 ②从句若与事实不符，用虚拟式**

（4）从句顺序：**连接词+陈述句语序**

考题：【推荐生 2021,32】【省招 2011,34】【省招 2012,28】

3. 主语从句

（1） **陈述句可用 it 形式主语，疑问句必须用 it 形式主语。**

（2） 连接词：

从句完整	that	不可省略

从句缺怎样	how	
从句缺是否	weather	
从句缺人	who	
从句缺物	what	
从句缺哪一个	which	
从句缺时间	when	
从句缺地点	where	

(3) 从句顺序：**连接词+陈述句语序**

考题：【推荐生 2012,10】

4. 同位语从句

(1) **有没有出现常见名词？从句是解释先行词本身的吗(将先行词与从句用 be 动词相连，若符合句意及语法即为同位语从句）？**

(2) 在表示劝告、命令、建议等含义的名词 (plan/advice/suggestion/order/proposal/idea) 后的同位语从句，**谓语动词为（should）do（永为原型）(特殊词，虚拟式同位语从句，句子)**

(3) 连接词 **(看句意而不是语法)**：

从句完整	that	不可省略
从句缺原因	because	
从句缺是否	weather	
从句缺人	who	
从句缺物	what	
从句缺哪一个	which	
从句缺时间	when	
从句缺地点	where	
从句缺怎样	how	

(4) 从句顺序：**连接词+陈述句语序**

(5) **当主句谓语较短，同位语从句较长时，将同位语从句与名词分离并后置。**这种情况下区分同位语从句与定语从句的妙招是：**将先行词与从句用 be 动词相连，若符合句意及语法即为同位语从句。**

考题：暂无

5. 定语从句（修饰名词）(用什么连接词取决与先行词在从句中是什么成分)

关系代词	that	①（**some/any/none/both...（次数或代词）+）介词+关系代词时，指人只能用 whom，指物只能用 which，**所有格用 whose ②**关系代词做动词间接宾语时用 to/for 。其中 to/for 可放于 whom/which 前，不能放于 that/who 前。若从句中谓语是以介词结尾的短位动词则不可移前**
	who/whom（取决于先行词在从句中成分）	
	which	
	whose sth.= the sth. of which/whom = of which/whom the sth.（取决于先行词)	
关系代词	**when = on/in/during/... which**	当把时间化成事件时不用 when
	where = in/on/at/... which	
	why = for which	

限定性状语从句	非限定性状语从句
连接词作宾语可省略， 可用 that 可用 who 代替 whom	连接词作宾语不可省略 不可用 that 不可用 who 代替 whom
只能用 that： **①先行词为不定代词** **②有 the only/the very/the last...修饰** **③有 all/any/no...修饰或有序数词修饰** **④有最高级修饰** ⑤主句是 who（先行词为人时）/which（先行词为物时）的问句 ⑥做从句表语 ⑦人和物同时出现	

考题：【推荐生 2013,9】【推荐生 2014,7】【推荐生 2020,45】【推荐生 2020,46】【推荐生 2020,98】【推荐生 2021,25】【推荐生 2021,29】【省招 2011,28】【省招 2012,27】【省招 2012,32】【省招 2013,27】【省招 2015,23】【省招 2019,50】【省招 2019,55】

6. 虚拟语气用来表示说话人的主观愿望、假想、怀疑、猜测、建议等：

①

	条件从句	**主句**
与现在或将来事实相反	动词过去式，**其中 be 的过去式用 were**	should（第一二三人称）或 would（第二三人称）+动词原形
与过去事实相反	had+过去分词	should（第一二三人称）或 would（第二三人称）+have+过去分词

②动词原形（do. sth.!）。

③

与现在或将来事实相反	**（should+）动词原形**
与过去事实相反	（should+）have+过去分词

④表示与将来事实可能相反时，条件从句的谓语可用 were to do（多书面体）和 should do。表假想性很强但实现可能性很小。

⑤当条件从句与主句中动作发生时间不一致时，动词形式根据①中进行调整。

⑥书面语中，可将谓语中的 were/should/would 提前至主语前，即可省略 if。

⑦可用于除了主语从句、表语从句、同位语从句外的：

宾语从句	**但若 wish 是过去式，则从句不能用虚拟语气** **可以用（should+）动词原形或 would/might+动词原形，后者表有可能实现**
定语从句	**it's time （that）sb+动词过去式（其中 be 的过去式用 were）**
状语从句	**①as if/as though 表比较或方式时+动词过去式（其中 be 的过去式用 were）** **②lest/in case 表目的时（有时 in case 表目的是客观的）+（should+）动词原形** **③whether/if/even if/though/whatever（及其它-ever）/as long as+动词原形** **④so that/in order that+may/might/can/could+动词原形**

考题：【推荐生 2012,8】【推荐生 2020,96】【推荐生 2021,38】【省招 2009,27】【省招 2010,23】【省招 2015,28】

7. **强调句：it+is/was+强调部分+that/who**

考题：【推荐生 2020,100】【推荐生 2021,35】【省招 2011,31】

8. **倒装句：not only+变位系动词提前+不变位的句子,but also+正常句子**

考题：【推荐生 2020,99】

9. **好句好段见附。**

物理方法整理

1. 极限

易考：**极大，极小，平均。**

提示：不要浪费时间。

考题：【推荐生 2013,7】【推荐生 2017,44】【省招 2018,20】

2. 目测及设数

易考：计算题未知数**直接按选项设单位 1。**

提示：不要浪费时间。

考题：【推荐生 2010,6】【推荐生 2019,96】

3. 证明

易考：选项答案明显且易证明的题**直接证明。**

提示：不要浪费时间，**有些题证明选项不一定能判断对错，但可以判断组合。分类讨论。**

考题：【推荐生 2016,4】【推荐生 2017,39】【省招 2018,15】【省招 2018,18】

4. 电路

易考：①实际功率（**P 物=P 总-P 损。若理想情况 P 损=0W，P 物=P 总=xW，则现实情况下 R 损越大，R 中越大，P 总越小）（P 总=P 电路+P 电动机）。**

②电压电阻之比（**串联中 U1：U2=R1：R2,并联中 I2：I1=R1：R2）（忽略电压表的存在）。**

③图表求电流电压电阻（**延长一次函数求电源电压。用电器串联时取最小电流，并联时取最小电压）。**

④磁场方向（**补全图像并注意电流正方向）。**

⑤W=Pt（**不知 t 不能比较 W 大小）。**

⑥**纯并联电路单独工作 I 互不影响，并串混联则不一定。**

⑦**直导线磁场方向与安培定则判断相同，但要注意电流正方向。**

提示：**并联中(1/R1)+(1/R2)=(1/R 总)。考虑在不损坏电器的情况下进行操作。**

考题：【推荐生 2010,5】【推荐生 2010,6】【推荐生 2016,5】【推荐生 2017,45】【推荐生 2019,102】【推荐生 2020,28】【推荐生 2021,29】【推荐生 2021,32】【省招 2011,6】【省招 2011,19】【省招 2013,10】【省招 2013,12】【省招 2014,7】【省招 2014,21】【省招 2014,31】【省招 2016,15】【省招 2016,16】

5. 运动

易考：①求力的大小（**将已知运动方向及力的大小画出，在平衡状态下列方程式）（未动的情况：没有力直接作用时看作一个整体，有力作用时受静摩擦力）（明确哪两个力是平衡力）。**

②摩擦力方向及大小（**与速度无关，相对位移方向的反方向为摩擦力方向）。**

③弹簧的综合利用（**考虑范围）。**

④力的分解。

⑤**空气没有惯性，惯性来源于物体。**

⑥**是否忽略阻力（代表是否物体总机械能不变）。**

⑦**静止与匀速直线状态相同，均 f=F。**

提示：注意**“光滑”“像距”“物距”**等提示。

考题：【推荐生 2010,8】【推荐生 2015,8】【推荐生 2016,3】【推荐生 2016,7】【推荐生 2018,91】【推荐生 2019,97】【推荐生 2019,98】【推荐生 2019,100】【推荐生 2019,101】【推荐生 2019,103】【推荐生 2020,27】【推荐生 2021,26】【推荐生 2021,30】【推荐生 2021,34】【省招 2010,8】【省招 2010,10】【省招 2010,17】【省招 2010,18】【省招 2011,7】【省招 2011,14】【省招 2012,25】【省招 2013,7】【省招 2014,4】【省招 2014,8】【省招 2016,20】【省招 2018,14】

6. 成像

易考：①倒影成什么像。

②平面镜与凸透镜搭配的情况下成虚像实像个数 **(平面镜与平面镜直接可以多次，且平面镜上的虚像可以通过凸透镜进行成像)。**

③**色散时紫色折射角最大。**

提示：**观察位置到底在哪里。思考光从哪里到哪里（容易写反以此判断对错)。**

考题：【推荐生 2016,1】【推荐生 2017,38】【推荐生 2018,96】【推荐生 2020,23】【推荐生 2020,26】【省招 2015,9】【省招 2015,17】

第二部分·考前冲刺整理

本部分的所有知识点和题目请尽量全部搞懂，做到会用。
建议做完推荐生和省招试题后再每周复习一次方法与知识点。

数学

① $\frac{1}{x}+\frac{1}{y+z}=\frac{1}{2}$, $\frac{1}{y}+\frac{1}{z+x}=\frac{1}{3}$, $\frac{1}{z}+\frac{1}{x+y}=\frac{1}{4}$, 求 $\frac{2}{x}+\frac{3}{y}+\frac{4}{z}$

解: $\frac{x+y+z}{xy+xz}=\frac{1}{2}$, $\frac{x+y+z}{xy+yz}=\frac{1}{3}$, $\frac{x+y+z}{xz+yz}=\frac{1}{4}$, 设 $x+y+z=k$

$xy+xz : xy+yz = 2k : 3k : 4k$, $x+y+z=k$

$xy : xz : yz = k : 3k : 5k$.

原 $=\frac{2yz+3xz+4xy}{x+y+z}=2$.

② $a+b+c=9$, $\frac{1}{a+b}+\frac{1}{b+c}+\frac{1}{a+c}=\frac{10}{9}$, 求 $\frac{c}{a+b}+\frac{b}{a+c}+\frac{a}{b+c}$

解 原 $=\frac{9-(a+b)}{a+b}+\frac{9-(a+c)}{a+c}+\frac{9-(b+c)}{b+c}=9\left(\frac{1}{a+b}+\frac{1}{b+c}+\frac{1}{a+c}\right)-3=7$.

③ $\frac{x}{3y}=\frac{y}{2x-5y}=\frac{6x-15y}{y}$, 求 $\frac{4x^2-5xy+6y^2}{x^2-2xy+3y^2}$.

解 $\because 2x^2-5xy=3y^2$, $y^2=(6x-15y)(2x-5y)$, $xy=18xy-45y^2$.

$\therefore (x-3y)(2x+y)=0$, $(x-3y)(x+5y)=0$, $(x-3y)(2x-5)=0$

$\therefore x-3y=0$, $x=3y$.

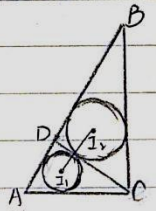
$\therefore$ 原 $=\frac{9}{2}$.

④ $m|x|-x-m=0$, 求 m 取值范围

解 $\because (\pm m-1)x=m$.

$\therefore x>0$ 时, $x=\frac{m}{m-1}$, $m>1$; $x<0$ 时, $x=-\frac{m}{m-1}$, $m>-1$

$\therefore m>1$



⑤ CD为RT△ABC的高, I_1、I_2为△ADC、△BDC内心, AC=3, BC=4

求 I_1I_2

解 $\because AB=5$, $CD=\frac{12}{5}$, $AD=\frac{9}{5}$, $BD=\frac{16}{5}$

$\because r=\frac{a+b-c}{2}$ $\therefore I_1E=\frac{2}{5}$, $I_2F=\frac{2}{5}$

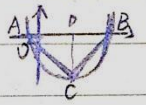
$\therefore I_1D=\frac{2}{5}\sqrt{5}$, $I_2D=\frac{4}{5}\sqrt{5}$, $\therefore I_1I_2=\sqrt{5}$

⑥ $y=ax^2+bx+c$ 交x轴于A、B两点为C, 当△ABC为正三角形时, 求Δ;

解 $\because AB=\frac{\sqrt{\Delta}}{|a|}$, $CD=\left|\frac{-\Delta}{4a}\right|$, $\frac{\sqrt{3}}{2}AB=CD$.

$\therefore \frac{\sqrt{3}}{2}\cdot\frac{\sqrt{\Delta}}{|a|}=\left|\frac{-\Delta}{4a}\right|$.

$\because a>0$ 时, $\frac{\sqrt{3}\sqrt{\Delta}}{2a}=\frac{\Delta}{4a}$, $\sqrt{3}=\frac{\sqrt{\Delta}}{2}$, $\sqrt{\Delta}=2\sqrt{3}$, $\Delta=12$; $a<0$ 时同理

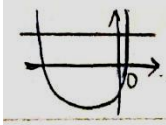


⑦ 已知 $mn\neq 1$, 且 $5m^2+2010m+9=0$, $9n^2+2010n+5=0$, 求 $\frac{m}{n}$

解 式⑦同除 n^2 $\therefore 5\cdot\frac{1}{n^2}+2010\cdot\frac{1}{n}+9=0$ $\therefore m$、$\frac{1}{n}$ 为 $5m^2+2010x+9=0$ 两根

$\because mn\neq 1$ $\therefore m\neq\frac{1}{n}$ $\therefore \frac{m}{n}=x_1\cdot x_2=\frac{5}{9}$.

⑧ m、n 为方程 $(x-a)(x-b)=3$ 的两根, 若 $a<b$, $m<n$, 求 a、b、m、n 大小关系



当$(x-a)(x-b)=3$时，x为m,n 解：$\therefore m<a<b<n$

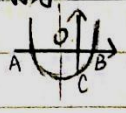
当$(x-a)(x-b)=0$时，x为a,b

⑫ 已知非负实数x,y,z满足$x+y+z=1$，求$t=2xy+yz+2zx$最大值

解：$\because t=2x(y+z)+yz \leq 2x(y+z)+\frac{1}{4}(y+z)^2=2x(1-x)+\frac{1}{4}(1-x)^2=-\frac{7}{4}(x-\frac{2}{7})^2+\frac{4}{7}$

⑬ $y=ax^2+bx+c$交x轴于$A(-2,0)$与B，交y于C，且$OB=OC$，则正确的为____.

(1) $2b-c=2$ (2) $a=\frac{1}{2}$ (3) $ac=b+1$ (4) $\frac{a+b}{c}>0$



解：$\because a>0, c<0, b>0$ $\therefore \frac{a+b}{c}<0$ ——(4)错

$\because BO=CO=-c$ $\therefore B(-c,0)$ $\therefore ac^2-bc+c=0$. $ac+b+1=0$ ——(3)对

$\because A(-2,0)$ $\therefore$ 韦达，$2c=\frac{c}{a}$ ——(2)对

$\because a=\frac{1}{2}$, $ac=b+1=0$ $\therefore \frac{c}{2}-b+1=0$, $c-2b+2=0$ ——(1)对

⑭ x,y,z为非负实数，已知$3x+2y+z=5$，$x+y-z=2$，若$S=2x+y-z$，求$S_{max}+S_{min}$

解：当$-z=0$时S最大 $\therefore z=0, x=1, y=1$ $\therefore S_{max}=3$.

$\because \begin{cases}4x+3y=0\\ x+3z=1\end{cases}$ (联立) $\therefore \begin{cases}y=\frac{1-4x}{3}\\ z=\frac{1-x}{3}\end{cases}$ $\therefore S=x+1$. $\therefore S_{min}=1$.

⑮ $\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=0$, $a^2+b^2+c^2=1$，求$a+b+c$.

解：$\because \frac{ab+bc+ac}{abc}=0$ $\therefore 2ab+2ac+2bc=0$

$\because (a+b+c)^2=a^2+b^2+c^2+2ab+2ac+2bc=1$.

$\therefore a+b+c=\pm 1$

⑯ a,b,c,d为四互不相等正实数，若$(a^{2019}-c^{2019})(a^{2019}-d^{2019})=2019$, $(b^{2019}-c^{2019})(b^{2019}-d^{2019})=2019$，求$(ab)^{2019}-(cd)^{2019}$.

解：设$a^{2019}=A$, $b^{2019}=B$, $c^{2019}=C$, $d^{2019}=D$.

$\therefore A,B$为$x^2-(C+D)x+CD-2019=0$两根

$\therefore AB=\frac{CD-2019}{1}$ $\therefore$ 原$=AB-CD=-2019$.

⑰ $x^2+2xy+3y^2=34$的整数解的组数为____.

解：$\because (x+y)^2+2y^2=34$ $\because 34, 2y^2$为偶数 $\therefore x+y$为偶数

设$x+y=2t$ $\therefore (2t)^2+2y^2=34$, $2t^2+y^2=17$.

$\therefore \begin{cases}t=\pm 2\\ y=\pm 3\end{cases}$ $\therefore$有4组.

⑱ 设$x,y,z\in\{a\mid a\leq 0\}$，则$x+\frac{1}{y}$、$y+\frac{1}{z}$、$z+\frac{1}{x}$中____

A 均不大于-2 B. 均不小于-2 C. 至少有一个不大于-2 D. 至少有一个不小于-2

解 $\because (x+\frac{1}{x})+(y+\frac{1}{y})+(z+\frac{1}{z})\leq -6$ $\therefore C$.

⑰ $3m^2-7m-5=0$, $5n^2+2n-3=0$, 其中m,n为实数, 求$|m-\frac{1}{n}|$

解 求⑰同除$-n^2$ $\therefore 3\frac{1}{n^2}-2\cdot\frac{1}{n}-5=0$ $\therefore \frac{1}{n}$、m为$3x^2-2x-5=0$两根

$\therefore x_1=-1$, $x_2=\frac{5}{3}$ $\therefore$原$=\frac{8}{3}$或0

⑱ a,b,c为正整数且$a>b$, 若$a^2-ab-ac+bc=7$, 求$a-c$

解 $\because$原$=(a-c)(a-b)$ $\because a>b$ $\therefore a-c=1$或7

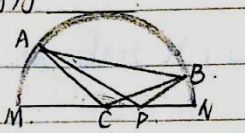
⑲ a,b,c为非零实数且$a+b+c\neq 0$, 若$\frac{a+b-c}{c}=\frac{a-b+c}{b}=\frac{-a+b+c}{a}$, 求$\frac{(a+b)(b+c)(a+c)}{abc}$

解 $\because \frac{(a+b-c)+(a-b+c)+(-a+b+c)}{a+b+c}=1$ $\therefore \frac{a-b}{c}-\frac{c}{c}=1$, $\frac{a+c}{b}-\frac{b}{b}=1$, $\frac{b+c}{a}-\frac{a}{a}=1$

$\therefore \frac{b+c}{a}=\frac{a+c}{b}=\frac{a+b}{c}=2$ $\therefore$原$=8$.

⑳ 若$\sqrt{a}+\frac{1}{\sqrt{bc}}<\sqrt{b}+\frac{1}{\sqrt{ac}}<\sqrt{c}+\frac{1}{\sqrt{ab}}$, 则$a,b,c$大小关系为

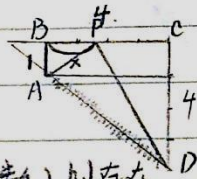
解 $\because$原: $\frac{\sqrt{abc}+1}{\sqrt{bc}}<\frac{\sqrt{abc}+1}{\sqrt{ac}}<\frac{\sqrt{abc}+1}{\sqrt{ab}}$ $\therefore a<b<c$



㉑ 已知$\angle CAP=\angle CBP=10°$, $\overset{\frown}{AM}=40°$, 求$\overset{\frown}{BN}$

解 $\therefore A,B,C,P$四点共圆 $\therefore$圆内接四边形, $\angle ABP=40°$, $\angle ABC=30°$

$\therefore \angle ACB=120°$, $\overset{\frown}{BN}=20°$



㉒ 若$y=\sqrt{x^2+1}+\sqrt{(4-x)^2+4}$, 求$y_{MIN}$

解 $\therefore y_{MIN}=5$

㉓ 若RT△两直角边为$mx^2-2x-m+1=0$两根(m为整数), 则有在____个RT△.

解 $\because x_1\cdot x_2=\frac{m+1}{m}$, $x_1+x_2=\frac{2}{m}$ $\therefore$不存在

㉔ a,b,c为实数, $a+b+c=5$, $ab+bc+ac=3$, 求c_{MAX}

解 $\because a+b=5-c$, $ab=3-c(a+b)=3-5c+c^2$

$\because$韦达定理, a,b为$x^2-(5-c)x+(c^2-5c+3)=0$的根

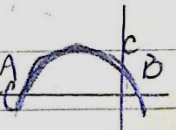
$\because \Delta=(5-c)^2-4(c^2-5c+3)\geq 0$ $\therefore -(3c-13)(c+1)\leq 0$ $\therefore c_{MAX}=\frac{13}{3}$

㉕ $y=ax^2+bx+c$交x轴于A,B, 交y轴于C, 若$BO=CO=\frac{1}{2}AO$, 求b

解 $\therefore B(c,0)$, $A(-2c,0)$

$\therefore -6bc-3c=0$, $b=-\frac{1}{2}$

$\begin{cases} 0=c^2\cdot a+c\cdot b+c \\ 0=(-2c)^2\cdot a+(-2c)\cdot b+c \end{cases}$



㉖ a,b,c为实数, $y=ax^2+bx+c$交x轴于A,B, 交y轴于C, 且顶点在直线$y=-1$上, 若RT△ABC, 求其最大面积.

解 $\because C(0,c)$, $A(x_1,0)$, $B(x_2,0)$, 且$x_1<0<x_2$ $\therefore$射影定理, $c^2=-x_1\cdot x_2$

$\therefore x_1+x_2=-\frac{b}{a}$, $x_1\cdot x_2=\frac{c}{a}$ $\therefore c^2=-\frac{c}{a}$, $c=-\frac{1}{a}$ $\therefore \frac{4ac-b^2}{4a}=-1$, $4a=4+b^2$

$\therefore a\geq 1$ $\because S_{\triangle ABC}=\frac{1}{2}|c|\cdot|x_1-x_2|=\frac{1}{2}\sqrt{(x_1+x_2)^2-4x_1x_2}=\frac{1}{2|a|}\sqrt{b^2+4}=\frac{1}{a\sqrt{a}}\leq 1$

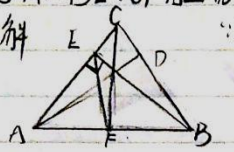
⑯ $x\sqrt{y}+y\sqrt{x}-\sqrt{2011x}-\sqrt{2011y}+\sqrt{2011xy}=2011$，$(x,y)$有＿＿种

解：原式 $x\sqrt{y}+y\sqrt{x}-\sqrt{2011x}-\sqrt{2011y}+\sqrt{2011xy}-2011$

$=(-\sqrt{2011}+\sqrt{x}+\sqrt{y})(\sqrt{2011}-\sqrt{xy})$

$\because -\sqrt{2011}-\sqrt{x}-\sqrt{y}\neq 0 \quad \therefore \sqrt{2011}-\sqrt{xy}=0 \quad \therefore (x,y)=(2011,1)$或$(1,2011)$

⑰ AD、BE、CF为$\triangle ABC$三条高，若$AB=6$，$BC=5$，$EF=3$，求BE

解 

$\because EF=3$，$AB=6$ $\therefore F$为中点 $\therefore \triangle ABC$为等腰 $\therefore BE=\frac{5}{5}$

⑱ 已知b^2-4ac为$ax^2+bx+c=0$的一个实数根，求ab取值范围

解 设$b^2-4ac=m$ $\therefore m=\frac{-b\pm\sqrt{m}}{2a}$ 设$m=\frac{-b+\sqrt{m}}{2a}$ $\therefore 2am+b=\sqrt{m}$

$\because 2am+b\geq 2\sqrt{2abm}$ $\therefore 2\sqrt{2abm}\leq\sqrt{m}$ $\therefore 8ab\leq 1$

⑲ 知$b>0$，$a^2+2ab+c^2=0$，$bc>a^2$；求a,b,c大小关系

解 $\because bc>a^2$，$b>0\longrightarrow c>0$ $\because 2ab=a^2+c^2\longrightarrow a>0$

$\because a^2-2ab+c^2=0\longrightarrow b\geq c\longrightarrow$当$b=c$时，$a=b=c$，不成立$\longrightarrow b>c$

$\therefore b^2>bc>a^2\longrightarrow b>a$ $\therefore a^2+c^2=2ab>2a^2\longrightarrow c>a$

$\therefore b>c>a$

⑳ a,b,c为正数，且$a+b+ab=3$，$b+c+bc=8$，$a+c+ac=15$，求$3a+2b+c$

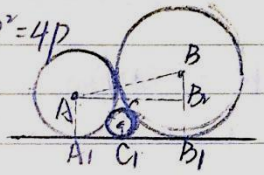
解 $\therefore \begin{cases} a+b+ab+1=3+1 \\ b+c+bc+1=8+1 \\ a+c+ac+1=15+1 \end{cases}$ $\therefore \begin{cases} (a+1)(b+1)=4 \\ (b+1)(c+1)=9 \\ (a+1)(c+1)=16 \end{cases}$ $\therefore \begin{cases} a=\frac{1}{2} \\ b=3 \\ c=5 \end{cases}$ $\therefore$原$=11$

㉑ p,q为$x^2+px+2q=0$两根，求$p+q$

解 $\because p+q=-p$ $\therefore q=-2p$ $\because p\cdot q=2p$ $\therefore -2p^2=4p$

$\therefore p=2$，$q=-4$ $\therefore$原$=-2$

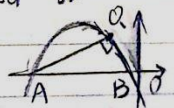
㉒ $\odot A\odot B\odot C$相互相切且半径分别为a,b,c，则$\sqrt{a}$、$\sqrt{b}$、$\sqrt{c}$成什么关系



解 $\therefore A_1B_1=\sqrt{(a+b)^2-(b-a)^2}=2\sqrt{ab}$，$B_1C_1=2\sqrt{bc}$，$A_1C_1=2\sqrt{ac}$

$\therefore A_1C_1+B_1C_1=A_1B_1$ $\therefore \sqrt{ab}=\sqrt{bc}+\sqrt{ac}$，$\frac{1}{\sqrt{c}}=\frac{1}{\sqrt{a}}+\frac{1}{\sqrt{b}}$

㉓ $y=ax^2+bx+c$如图，$Q(n,2)$为图上一点，且$AQ\perp BQ$，求a



解 设$ax^2+bx+c=0$两根x_1+x_2 $\therefore x_1+x_2=-\frac{b}{a}$，$x_1\cdot x_2=\frac{c}{a}$

$\because AQ\perp BQ$ $\therefore AQ^2+BQ^2=AB^2$ $\therefore (x_1-n)^2+4+(x_2-n)^2+4=(x_1-x_2)^2$

$\therefore n^2-n(x_1+x_2)+4+x_1x_2=0$ $\therefore n^2+\frac{b}{a}n+4+\frac{c}{a}=0$，$an^2+bn+c=-4a$

∵(n,2)　∴$-4a=2$, $a=-\frac{1}{2}$

⑳ $\frac{xy}{x+y}=2$, $\frac{xz}{x+z}=3$, $\frac{yz}{y+z}=4$, 求 $7x+5y-2z$.

解 ∵ $\frac{1}{x}+\frac{1}{y}=\frac{1}{2}$, $\frac{1}{x}+\frac{1}{z}=\frac{1}{3}$, $\frac{1}{y}+\frac{1}{z}=\frac{1}{4}$

∴ $x=\frac{24}{7}$, $y=\frac{24}{5}$, $z=24$　∴原$=0$.

㉑ 设 $a=\frac{\sqrt{5}-1}{2}$, 求 $\frac{a^5+a^4-2a^3-a^2-a+2}{a^3-a}$

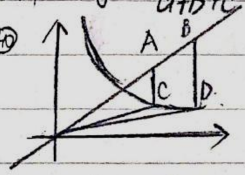
解 ∵ $a=\frac{\sqrt{5}-1}{2}$　∴ $a^2=-\frac{\sqrt{5}-1}{2}+1=1-a$　∴ $a^2+a=1$

∴原$=\frac{a^3(a^2+a)+2a^3-(a^2+a)+2}{a\cdot a^2-a}=\frac{a^3-2a^3-1+2}{a(1-a)-a}=\frac{1-a^3}{-a^2}$

$=-\frac{1-a^3}{1-a}=-(1+a+a^2)=-2$.

㉒ 已知 a,b,c 为非零实数 且 $\frac{a+b}{c}=\frac{a+c}{b}=\frac{b+c}{a}=k$ 则 $y=kx+(2-k)$ 一定过什么象限

解 ∵原$=\frac{2(a+b+c)}{a+b+c}=k$　∴ $k_1=2$, $k_2=0$　∴必过第一象限

⑮ 

A,B在直线 $y=x$ 上, 过A,B作y轴平行线AC,BD交于 $y=\frac{1}{x}$ 于C,D, 若 $BD=\sqrt{2}AC$, 求 $2OC^2-OD^2$

解 设 $C(a,b)$, $D(c,d)$, $A(a,a)$, $B(c,c)$

∴ $ab=cd=1$　∵ $BD=\sqrt{2}AC$ → $c-d=\sqrt{2}(a-b)$ → $c^2-2cd+d^2=2(a^2-2ab+b^2)$

→ $2(a^2+b^2)-(c^2+d^2)=4ab-2cd$ → $2OC^2-OD^2=2$

㉓ 如果 a,b 为质数, $a^2-13a+m=0$, $b^2-13b+m=0$, 求 $\frac{b}{a}+\frac{a}{b}$.

解 ∵ a,b 为 $x^2-13x+m=0$ 的两根　∴ $\begin{cases}a=13\\b=13\end{cases}$ 或 $\begin{cases}a=2\\b=11\end{cases}$ 或 $\begin{cases}a=11\\b=2\end{cases}$

∴原$=\frac{125}{22}$ 或 2

㉔ α,β 为 $x^2+(2m+3)x+m^2=0$ 两个实数根 且 $\frac{1}{\alpha}+\frac{1}{\beta}=1$, 求m.

解 ∵ $\frac{\alpha+\beta}{\alpha\cdot\beta}=1$　∴ $\frac{-\frac{b}{a}}{\frac{c}{a}}=-\frac{2m+3}{m^2}$　∴ $2m+3=m^2$

∴原: $x^2+m^2x+m^2=0$　∴ $\Delta>0$　∴ $12m>-9$, $m>-\frac{3}{4}$　∴ $m=3$.

㉕ $ax^2+bx+c=0$ 有两异号根 m,n, 且 $m<|m|$, 求 $cx^2+a(m-n)x-a=0$ 两根情况

解 ∴ $m<0$, $n>0$　∴ $mn=\frac{c}{a}<0$, $n-m>0$

∴ $\Delta_②=(a(m-n))^2+4ac=a^2(m+n)^2\geq 0$　∴②有实根为 x_1,x_2

∵ $x_1+x_2=\frac{a(n-m)}{c}<0$, $x_1\cdot x_2=-\frac{a}{c}>0$　∴ $x_1<0$, $x_2<0$

① 三角

$\pi\ rad = 180°$，则 $1\ rad = \frac{180°}{\pi} \approx 57°$

$\tan\alpha = \frac{\sin\alpha}{\cos\alpha}$　　$\sin\alpha = \tan\alpha \cdot \cos\alpha$　　$\cos^2\alpha + \sin^2\alpha = 1$

② 等差

$S_n = na_1 + \frac{n(n-1)}{2}d$（d为差值）　$m+n=x+y \Leftrightarrow a_m + a_n = a_x + a_y$

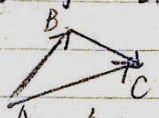
③ 等比

$S_n = \begin{cases} na_1 \\ \frac{a_1(1-q^n)}{1-q} = \frac{a_1 - a_n q}{1-q}\ (q\text{为比例}) \end{cases}$

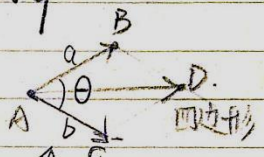
$S_n, S_{2n}-S_n, S_{3n}-S_{2n}$ 仍为等比，公比为 q^n.

④ $\vec{AB} + \vec{BC} = \vec{AC}$

$(x_1, y_1) + (x_2, y_2) = (x_1 + x_2, y_1 + y_2)$



三角形



四边形

$|a||b|\cos\theta$ 为数量积/内积

$\vec{AB} - \vec{AC} = \vec{CB}$

头起点，连终点，指被减

K、$\vec{AB}$ 向量符号　　(x, y) 向量　$|(x,y)| = \sqrt{x^2+y^2}$ 向量的模

$(|\vec{AB} + \vec{BC}|)^2 = (\vec{AB} + \vec{BC})^2$

数量积（不关注方向）$(x_a, y_a) \cdot (x_b, y_b) = x_1 \cdot x_2 + y_1 \cdot y_2 \Leftrightarrow a \perp b$

$(x_a, y_a) \cdot (x_b, y_b)$，如果 $x_a \cdot y_b = x_b y_a \Leftrightarrow a \parallel b$

黑体为向量

$|a \cdot b| \le |a||b|$　　$\cos\theta = \frac{a \cdot b}{|a||b|}$　　$a \cdot e$（模为1的单位向量）$= |a|\cos\theta$

⑤ P_n^m：从n中有顺序抽出m个　C_n^m：从n中无顺序抽出m个

$P_n^m = \frac{n!}{(n-m)!} = n(n-1)(n-2)\cdots(n-m+1)$

$C_n^m = \frac{n!}{(n-m)!m!} = \frac{n(n-1)(n-2)\cdots(n-m+1)}{m(m-1)\cdots 2\cdot 1} = C_n^{n-m}$　（做值日）

$C_n^{m'} + C_n^{m-1} = C_{n+1}^m$　（闪妹子）

$C_n^0 + C_n^1 + \cdots + C_n^n = 2^n$　（卖子往外跳）

$C_r^r + C_{r+1}^r + \cdots + C_n^r = C_{n+1}^{r+1}$ (火车头)

$\sum_{i=0}^{k} C_n^i C_m^{k-i} = C_{m+n}^k$ (男女分)

⑥
$$\begin{cases} a+b \geq 2\sqrt{ab} \\ a^2+b^2 \geq 2ab \\ ab \leq \frac{1}{4}(a+b)^2 \end{cases}$$

$$\sqrt{\frac{a^2+b^2}{2}} \geq \frac{a+b}{2} \geq \sqrt{ab} \geq \frac{2}{\frac{1}{a}+\frac{1}{b}}$$

$$\frac{a+b+c}{3} \geq \sqrt[3]{abc}$$

$$-\left(\left(-a\right)+\left(-b\right)\right) \leq -2\sqrt{ab} \quad (a, b<0)$$

⑦
$$\begin{cases} a^3-1 = (a-1)(a^2+a+1) \\ a^3+1 = (a+1)(a^2-a+1) \end{cases}$$

英语

① It's hard for elder people to see ___ convenience a smart-phone can bring us.

解: what

② Many thanks to whole team, ___ understanding and support, have made my success possible.

解: whose

③ He wrote many children's book, nearly half of ___ were published in the 1990s.

解 which

④ I read a report from Japan ___ points out that it's common sense to use both sides of the paper.

解 which/that

⑤ They reached the point ___ they wouldn't talk with each other.

解 where

⑥ He is ___ is known as a hacker.

解 what

⑦ It is the native language ___ helps shape the way we see things and express idea.

解 that

⑧ The moment ___ Leo will never forget is ___ Mr. Green gave him a lot of valuable advice on how to improve his writing

解 that/which, when

⑨ Don't you know that Australia was in fact ___ used to be a nation of prisoners?

解: what

⑩ We honor every day men and women ___ brave actions became historic events

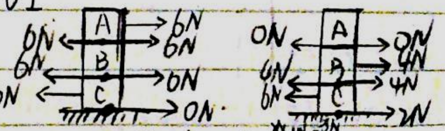
解 whose.

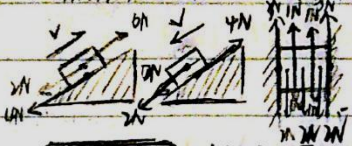
物理

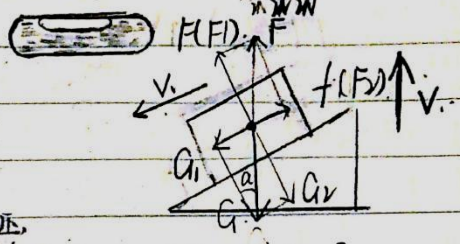
① $R_{接}\uparrow$，即 $R_{总}\uparrow$，即 $P_{总}=\frac{U^2}{R_{总}}$，即 $P_{用}\downarrow$

② 电压分配问题 成比例. $P=\frac{U^2}{R}=I^2R=UI$

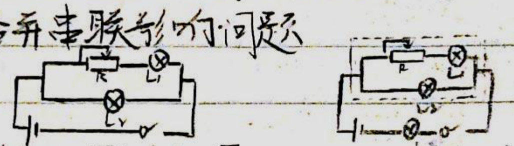
③ 受力分析：先看整体，再看个体.
静止/匀直同判断
动/静摩擦力问题
空气不动 物体动
拉力测力计只测拉力







④ 电路并串联影响问题



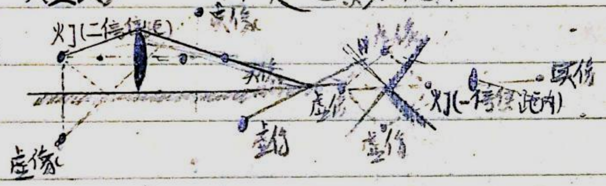
R的变化不影响L_1，因为并联两端电压不变

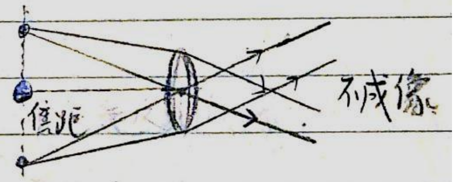
并联部分与L_3分压，所以R的变化影响L_2

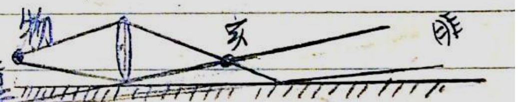
$G_1=\sin\alpha\cdot G$.
$f=\mu\cdot N=\mu\cdot G$.

⑤ 电路中用电器多 ⟶ 电阻小.
短路 ⟶ 不是电器烧坏

⑥



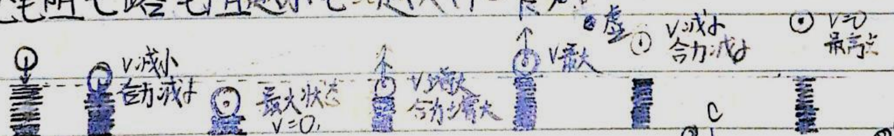




⑦ 电路中前提是量器正常工作

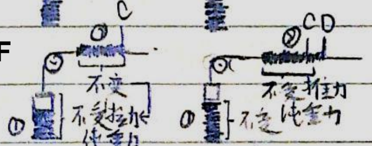
⑧ 纯电阻电路电阻越小电热越大（$P=\frac{U^2}{R}$）

⑨



先加速后减速（加速：g>F弹；减速：g<F弹）

⑩ 光的来源方向



⑪ $f=\mu\cdot N$. $F_{弹}=k\Delta x$

⑫ 加速上升/减速下降 ⟶ $F_{压}\uparrow$
加速下降/减速上升 ⟶ $F_{压}\downarrow$

$k_1\Delta x_1=G_{物}=k_2\Delta x_2$
$CD=\Delta x_1+\Delta x_2$

⑬ 纸内偏转 N S 磁场方向

电流运动方向

× × × ×：磁场方向向内
· · · ·：磁场方向向外
→ 代表磁场方向
电子方向（与电相反），正电荷方向

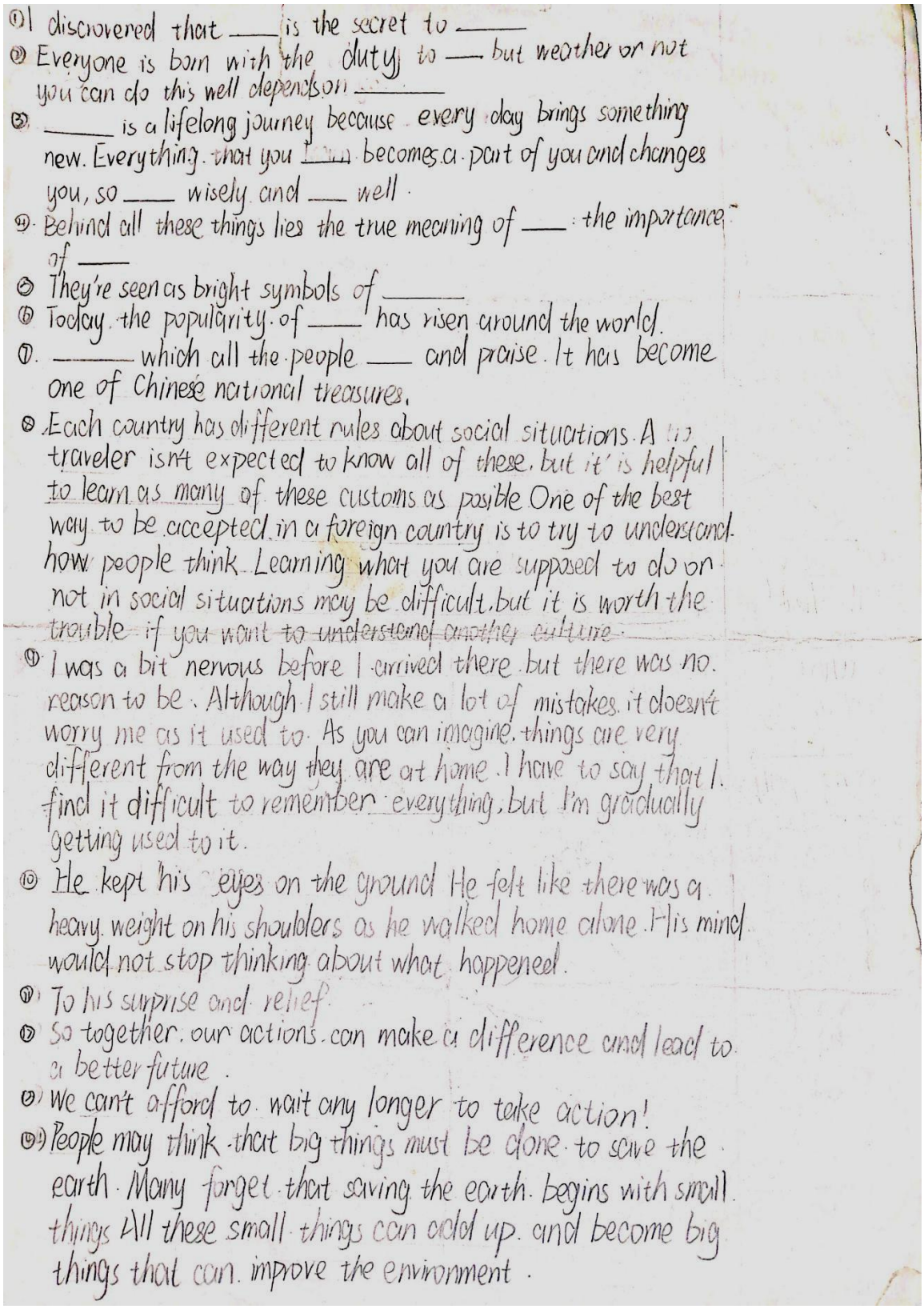
⑭ 电动机：$P_{总}=Q_{散失}+P_{对外做功}$

附录一·语文重点字词

黄晕yùn 着zhuó落 点缀zhuì 粗犷guǎng 狭隘ài 拈niān轻怕重
惩chéng戒 迷惘wǎng 伫zhù立 庇bì护 锋芒毕露lù 锲qiè而不舍
气冲斗dǒu牛 校jiào对 字帖tiè 祈qí祷 亘gèn古 呜咽yè 默契qì
憎zēng恶wù 疮chuāng疤 诘jié问 侮wǔ辱rǔ 惭怍zuò 晌shǎng午
妥帖tiē 修葺qì 迸bèng溅 忍俊不禁jīn 炽chì热 孤零líng零
千钧jūn重负 锐不可当dāng 翘qiáo首 悄qiǎo然 镌juān刻 匿nì名
黝yǒu黑 踱duó步 倔jué强jiàng 辟bì邪 惟妙惟肖xiào
遒qiú劲jìng 归省xǐng 行háng辈 欺侮wǔ 连翘qiáo 两栖qī
迁徙xǐ 缄jiān默 龟jūn裂 卑鄙bǐ 彷páng徨huáng 行xíng将就木
寒噤jìn 挣扎zhá 穹qióng顶 拾shè级 苍劲jìng 娉pīng婷
摇曳yè 箴zhēn言 宽宥yòu 矫jiǎo揉造作 游弋yì 间jiān不容发fà
轻觑qù 折shé本 恣zì睢suī 惘wǎng然 栈zhàn桥 前仆pū后继
行háng货 星宿xiù 不省xǐng人事 筵yán席 伤痕累lěi累 间jiàn或
狡jiǎo黠xiá 味同嚼jiáo蜡 吹毛求疵cī 信手拈niān来 契qì合
拘jū泥nì 诡谲jué 瘦削xuē 睥pì睨nì 侦缉jī 怯qiè懦
稽qǐ首 谬miù论 体恤xù 嗔chēn怪 歼jiān灭 忧心忡chōng忡
强qiǎng聒guō不舍 朴pō刀 慰藉jiè 翌yì日 浑身解xiè数 长吁xū短叹
遍稽jī群籍 汗流浃jiā背 潜qián移默化 空穴xué来风
楔xiē形 怏yàng怏不乐 恹yān恹欲睡 船楫jí 逻辑jí 混hùn为一谈
挑拨离间jiàn 箭在弦xián上 解jiě甲归田 剽piāo悍 棱léng角
瞠chēng目结舌 大有裨bì益 叱咤zhà 埋mán怨 癖pǐ好
针砭biān时弊 目眩xuàn晕

诀别 取决 遮蔽 枉然 安详 竹篾 凛冽 器宇 抉择
天骄 挫曳 旁骛 秘诀 游弋 杜绝 突然 恣睢 祝祭
逞能 练达 笼统 木版画 电话簿 水蒸气 发祥地 略见一斑
杯盘狼藉 怨天尤人 自力更生 各行其是 关关雎鸠 寥若晨星
好高骛远 变本加厉 适得其反 矫揉造作 责无旁贷 如法炮制
太相径庭 出其不意 巧夺天工 初生之犊 妄自菲薄 蔚为大观
殚精竭虑 气冲霄汉 惟妙惟肖 励精图治 再接再厉 淋漓尽致
不能自已 老生常谈 闲情逸致 掉以轻心 水泄不通 前仆后继
融会贯通 故作矜持 无理取闹 计日程功 鸠占鹊巢 言不及义
断章取义 关键其事 挖墙脚 枯燥 迫不及待 泛光掠影 锋芒毕露
妇孺皆知 张皇失措 不修边幅 风云变幻 按部就班 以身作则
直截了当 焕然一新

附录二・英语好句



① I discovered that ___ is the secret to ___

② Everyone is born with the duty to ___ but weather or not you can do this well depends on ___

③ ___ is a lifelong journey because every day brings something new. Everything that you ___ becomes a part of you and changes you, so ___ wisely and ___ well.

④ Behind all these things lies the true meaning of ___: the importance of ___

⑤ They're seen as bright symbols of ___

⑥ Today the popularity of ___ has risen around the world.

⑦ ___ which all the people ___ and praise. It has become one of Chinese national treasures.

⑧ Each country has different rules about social situations. A traveler isn't expected to know all of these, but it's helpful to learn as many of these customs as posible. One of the best way to be accepted in a foreign country is to try to understand how people think. Learning what you are supposed to do or not in social situations may be difficult, but it is worth the trouble if you want to understand another culture.

⑨ I was a bit nervous before I arrived there but there was no reason to be. Although I still make a lot of mistakes, it doesn't worry me as it used to. As you can imagine, things are very different from the way they are at home. I have to say that I find it difficult to remember everything, but I'm gradually getting used to it.

⑩ He kept his eyes on the ground. He felt like there was a heavy weight on his shoulders as he walked home alone. His mind would not stop thinking about what happened.

⑪ To his surprise and relief.

⑫ So together, our actions can make a difference and lead to a better future.

⑬ We can't afford to wait any longer to take action!

⑭ People may think that big things must be done to save the earth. Many forget that saving the earth begins with small things. All these small things can add up and become big things that can improve the environment.

⑮ Not only can the art bring happiness to others, but it also shows that even cold, hard iron can be brought back to life with a little creativity.

⑯ You were all so full of energy and thirsty for knowledge. Never fail to be thankful to the people around you. You'll make mistakes along the way, but the key is to learn from your mistakes and never give up. But along with difficulties, there will also be many exciting things waiting for you. Behind each door you open are chances to learn new things, and you have the ability to make your own choices. Choose wisely and be responsible for your decisions and actions. Although you have to go your separate way now. As you set out on your new journey, you shouldn't forget where you came from. The future is yours.

⑰ _____ is an inspiration to us all.

⑱ _____ with courage rather than fear in my heart

⑲ We should go out of our way to _____.

⑳ To cut down _____

㉑ What is more important than _____ is _____

㉒ Your biggest challenge might be learning how to behave _____

㉓ not only do _____, but also _____

㉔ A true _____ can reach for your hand and touch your heart.

㉕ Some scientists believe that _____. However, they agree it may take hundreds of years.

㉖ A good _____ is like a mirror. Then we can know what we're like from it.

㉗ whether _____ or not, it's up to you to decide.

㉘ The _____ Day falls on _____ in China.

㉙ Problems and worries are normal in life, but I think _____ helps a lot. Unless we _____, we'll certainly feel worse. It's best not to run away from our problems. We should always try to solve them. The first step is to _____. It's doesn't need to be _____, but _____ is always there to help us. In English, we say that.

_____ a problem is like cutting it in half. So we're halfway to solving a problem just by _____!

- I feel like I am between a rock and a hard place - in a difficult situation that I cannot seem to get out of.
- The importance of making good decisions and of being in control of one's life.
- If _____ die, _____ is a broken-winged bird that can never fly
- I'm sure my dream will come true as long as I hold on to it.
- The more _____, the more _____, the brighter our future will be.
- The _____ has been around for about _____ years and it's still popular among people, which reminds us that with the development of society, culture keeps changing, but something will remain unchanged, such as _____.
- Nobody likes failure, but we can always learn something valuable from it: No one can success without _____, this's what I learned from it
- _____, as the saying goes.
- _____ builds a bridge between _____ and _____
- It's my great pleasure to show my hearty thanks to you for _____.
- I hope you can understand my situation and forgive me. Would you mind if _____?
- But every coin has two sides. _____ has brought some benefits but also some serious problems
- Life shouldn't just be about _____
-

邀请信：

开：I'm writing to invite you to ____./I think it would be a great idea. if you participate in ____./It's my great honor to invite you to ____

中：Here are some details about this activity./The followings are some details about this activity/Some details about this activity are as follows

结：We would be looking forward to your coming with great pleasure/I would like to meet you there and please let me know your decision soon./I would feel honored if you could come./An early reply is appreciated./I do hope that you will accept my invitation if it is convenient to you

求助信：

开：I'm writing to you for some help. I find it extremely hard to do ____/Doing ____ is a terrible headache for me/I'm writing to ask you to do a favor. I have some difficulty in doing ____ which bothers me a lot. So I have no choice but to turn to you for help/I'm eager to get your timely help./I would appreciate it if you could do me a favor and ____/I would greatly appreciate your timely help.

道歉信：

开：I'm writing this letter to apologize to you for ____/I would like to express my deepest apology for not being able to ____/I must make a sincere apology to you for ____./I regret to inform you that I'm unable to ____/Please accept my sincere apology for ____ once more

建议信：

开：I'm very glad to receive your letter asking for my advice on how. ____/As far as I'm concerned, it would be wise to take the following actions.

结：I hope you will find these recommendations practical.

申请信：

开：I'm writing to request a valuable chance to be ____. The following are my advantages.

中：Not only am I good at ____, but also I'm experienced in ____

结：I'm confident that I'm suitable for ____/I would greatly appreciate

it if you could take my application into consideration.

感谢信

开：I'm writing to express my thanks for ____ / I'm truly grateful to you for ____ / Please accept my sincere appreciation again. / I would like to take this opportunity to express my great appreciation for your timely support and assistance. / It was kind and generous of you to do this for me, and I appreciate it more than I can say! Please accept my sincere thanks and best wishes

附录三·英语好段

学习榜样：

开头：

①Among _____, _____ has impressed me most.

②_____, one of the most well-known _____ in the twenty-first century, is the person I admire most.

③The whole nation felt very sad about the loss of a great ____.

中间：

①It has been plenty of years since ____ devoted himself to the _____.

②_____ in his _____ still worked in the front line. He made every effort to find any possible way to _____.

③As long as his life was going on, he would not stop **pursuing[pəˈsjuːŋ]** and dreaming for _____.

④They take the risk of _____ to _____. They are the heroes in my heart. I want to become one among them in the future.

⑤During this hard period, I was deeply impressed and moved by the selfless _____ fighters, who risked _____ to _____. Thanks to them, _____ now.

⑥I could not show enough thanks to _____. They made every effort to make _____ _____.

结尾：

①Thanks to ____ and tens of thousands of _____ like him, we believe we will ____.

②For _____, it requires the efforts of generations. As a result, all the teenagers should study harder to devote ourselves to our country like _____, our hero.We can take some measures to make more people be aware of the importance of _____.As an old saying goes,“Actions speak louder that words”,I believe even the simplest action can make a big difference on the _____.Let’s start out small to make the world a better place to live in!

③ His story reminds us that,no matter how society develops,every generation is supposed to play an important role in making the Chinese Dream come true.We should carry on his hard working spirit and devote ourselves to serving the society.So together,our actions can make a difference and lead to a better future.

科学看待：

开头：

①Recently,the problem of _____ has aroused people’s great concern and caused a **heated[ˈhiːtɪd]** discussion about it.

②With the development of science and technology,more and more people believe that

_____.

③_____ has play an increasingly important role in our daily life.It has brought a lot of benefits but has created some serious problems as well.For example,_____.

④Personally,I quite agree with the statement that _____.The reasons are chiefly as follows.

⑤Some are standing on the side of _____.But for me,I would rather think of the matter in _____ way.

⑥In my opinion,it is more advisable to _____ that to ____.

中间：

①But every coin has two sides,by the time we pay attention to its ____,on no account can we **ignore[ɪɡˈnɔː(r)d]** the value of _____.

②In order to handle the problem of _____,effective measures should be taken before the situation gets worse.

③From my point of view,I really think highly of _____.

④All in all,we can come to the conclusion that _____.

⑤We cannot **emphasize[ˈemfəsaɪz]** the importance of _____ too much every day.

⑥Attitudes **towards[təˈwɔː(r)d]** _____ **vary[ˈveəri]** from person to person.Some are in favor of the idea of ____,they point out the fact that _____.

结尾：

①In my view, we shouldn't say no to new forms of _____ just because they are not perfect yet, and it is up to us to make the tools better in the future.

②In my opinion, every coin has two sides. There is no doubt that _____ has its drawbacks as well as merits.We must plan and manage them properly to achieve a balance between _____ and _____.

③In my opinion, we can't decide whether _____ should _____ or not. It depends on every _____'s choice.

④Admittedly, _____ has some negative effects under **certain [ˈsɜːtn] circumstances [ˈsɜːkəmstənsɪz]**. However, after balancing all the pros and cons, the above-mentioned disadvantage seems to be **minor [ˈmaɪnə(r)]**.

传统文化：

开头：

①I think _____ has a great influence on both enriching my knowledge and making my life meaningful and relaxing.

②_____ Is a dream come true for me.It not only provides us with a chance to learn about the culture outside our daily life but also offers us a good opportunity to have a better understanding of other civilisations.

结尾：

①_____ has been around for thousands of years and it's still popular among

people,which reminds us that with the development of society,culture keeps changing,but something will remain,such as _____.

②If a culture wants to gain its life, it should change itself to **cater[ˈkeɪtə(r)]** to the people in its age. So does our traditional culture.Such as _____.The appearance of traditional culture may change, but the **essence[ˈesns]** will never change and will be well accepted.

美德:

（此处建议背诵一些传统美德的英文读法）

开头:

① Chinese traditional **virtue[ˈvɜːtʃuː]** is the excellent **moral[ˈmɒrəl]** heritage we **inherited[ɪnˈherɪtɪd]** from the **ancients[ˈeɪnʃ(ə)nts]**. We learned many moral characters, such as,_____ and so on through many old stories and life practice.

中间:

①China, a nation which has civilization of 5,000 years, puts _____ at a very important position.From the old to the young, from the important events to the daily things, it is common for people to use this rule to regulate their behavior.

②Chinese culture **advocates[ˈædvəkeɪt]** _____. This thought does not only seek for _____ but also for the harmony between human and nature and other creatures.

③This important part of _____ makes great contributions to establishing a harmonious society.

结尾:

①In summary, I am deeply convinced that all these great virtues had, have and still will have an important effect on the field of regulating people' s behaviors. The Chinese traditional virtues are not only the essence of ancient moral civilization, but also the **cohesion[kəʊˈhiːʒn]** of Chinese national family. Great efforts are **essential[ɪˈsenʃl]** for us to make in order to pursue and inherit all these invisible spiritual culture heritages.

中国梦伟大复兴:

开头:

①Great changes have taken place in my life since our government carried out the "__ ____ policy" .

②China carried out a new policy, allowing _____. The _____ policy is expected to deal with the challenge of ____ problem in China. However, not all people have shown their support for the new policy.

结尾:

①Making the Chinese Dream come true such as _____ is a lifelong journey for everyone.Unfortunately,many still believe that big things must be done to achieve these goals.But the fact is that every thing we struggle now will add up and play a positive role in realizing the great revival of the Chinese nation.

②We can't afford to wait any longer to take actions.After all,we have the duty,the ability and the determination of realizing the great revival of the Chinese nation!We are supposed to concentrate on studying and improving ourselves,which are of great importance for enabling our society to become better.And I do believe all of these actions can make a difference and lead to a better future!
③As an old saying goes,"Nothing is difficult if you put your heart into it".Please regard the difficulties as challenges!Don't worry about our problems. Let's face the challenges in a positive way instead.I believe our hard work will pay off as long as we hold on to it.

中国梦+学习他人：

His story reminds us that,no matter how society develops,every generation is supposed to play an important role in making the Chinese Dream come true.For _____, it requires the efforts of generations. As an old saying goes,"Actions speak louder that words",I believe even the simplest action can make a big difference on the _.As a result, all the teenagers should carry on his hard working spirit and devote ourselves to serving the society like _____, our hero.We can take some measures to make more people be aware of the importance of _____.Let's start out small to make the world a better place to live in!So together,our actions can make a difference and lead to a better future.

自我介绍+为什么选择济外：

（我把我的介绍作为例子放于此处，希望能对各位有所帮助）
It's my great honor to stand here to request a valuable opportunity to become a number of your school.I am Mac,an outgoing and hard-working boy,with good family education and wide interests such as reading and programming.
On the one hand,I study so hard that my grades are usually among the best.I have the experience of being in the top ten students in the final exams for many times in the whole school,even sometimes,in the whole Lixia District.On the another hand,not only am I good at playing the piano and got the Piano **amateur[ˈæmətə(r)]** level 10 **certificate[səˈtɪfɪkət]** four years ago,but I am also experienced in programming and won the Blue Bridge Cup Python programming national competition top 1 in ShanDong and the top 1% competitors in the whole China when I was in grade 7.
I do believe your school is the best place for me to get the further education because of its professional and **openness[ˈəʊpənnəs]**,so I can't wait to join you.All in all,I'm confident that I'm the suitable person for this chance.And I would greatly appreciate it if you could take my application into consideration!