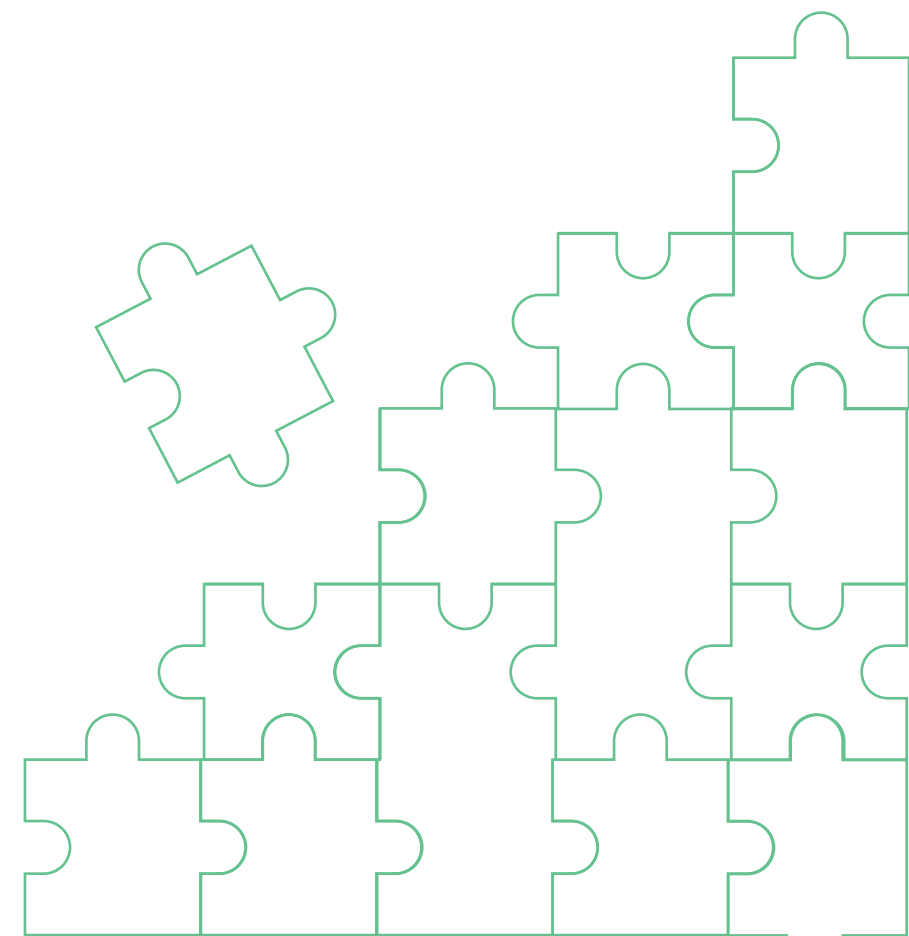
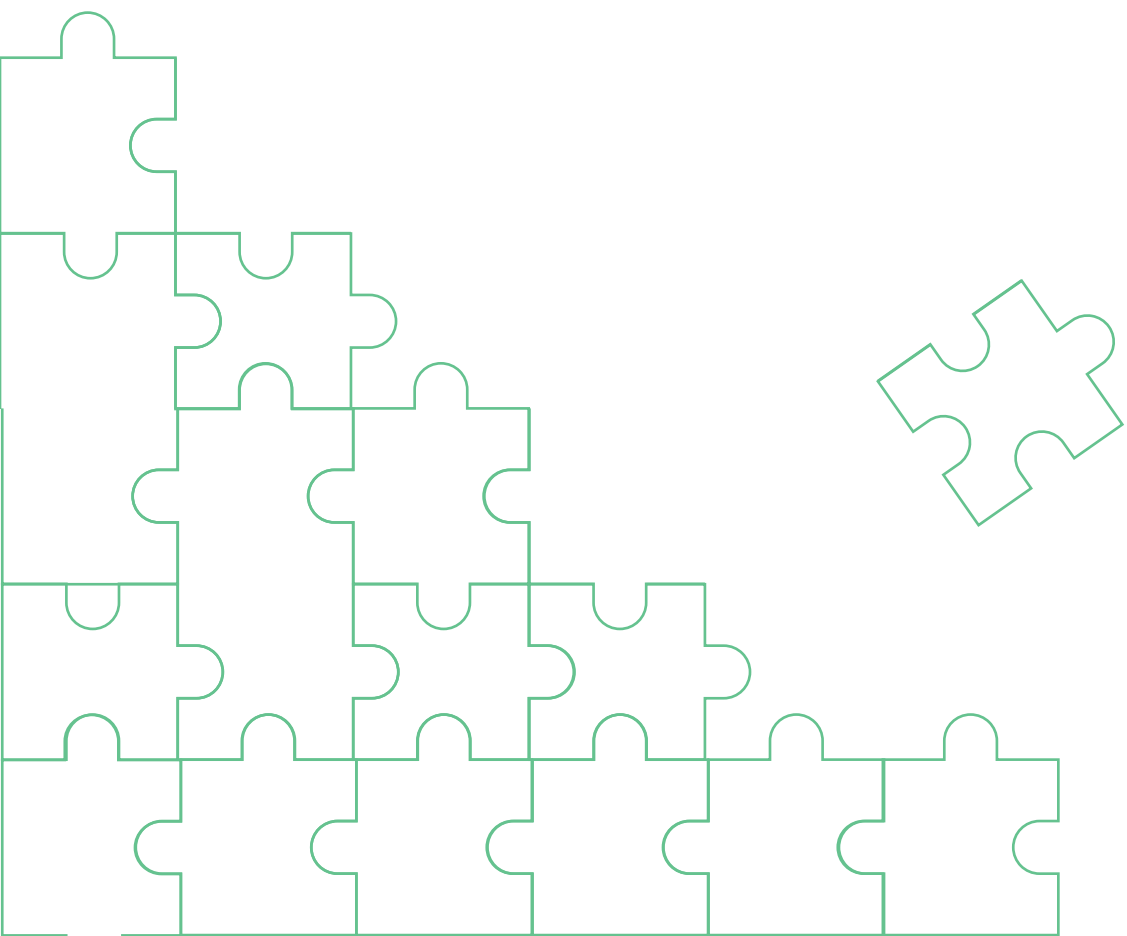
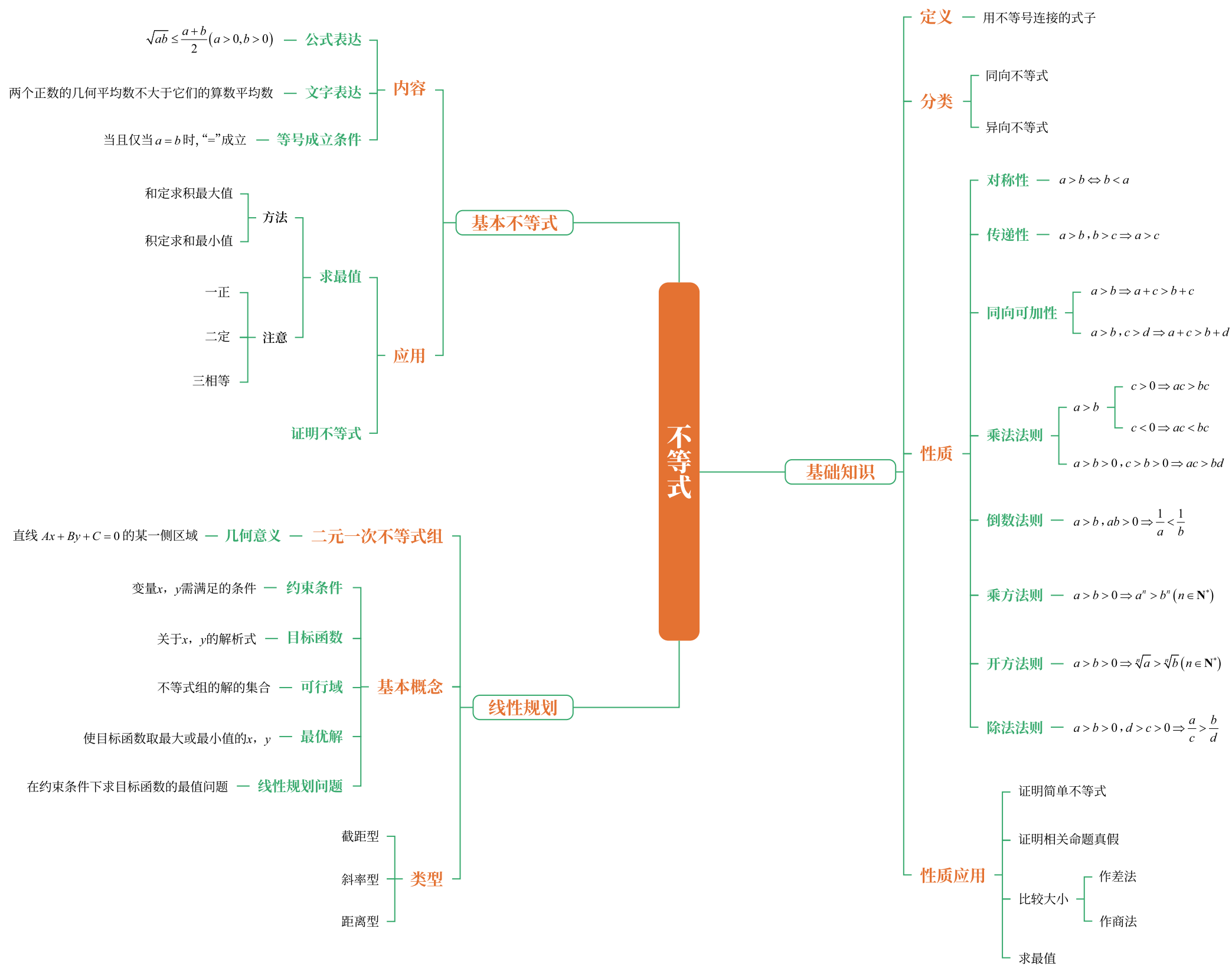
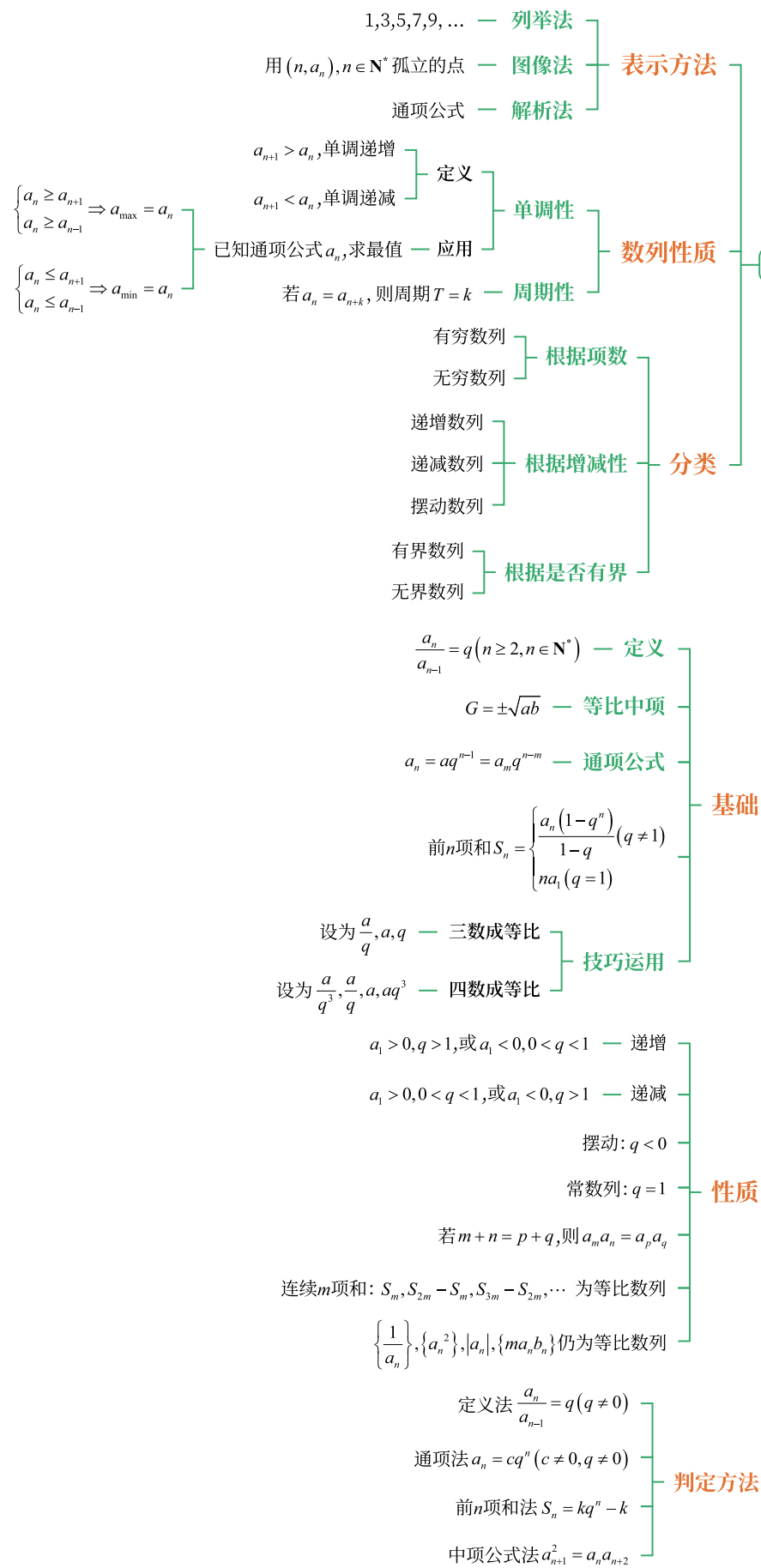


高二·数学篇

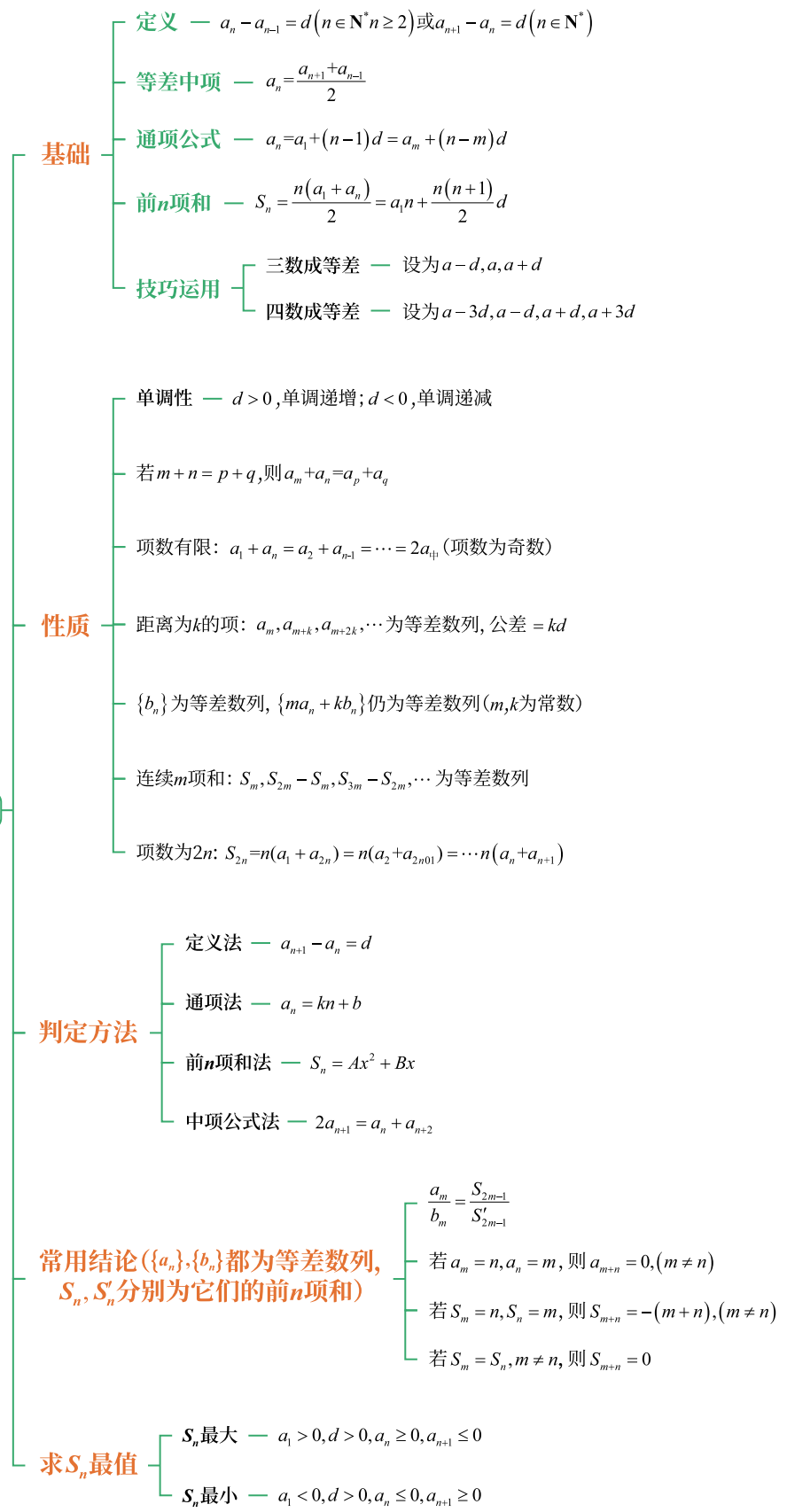
MATHEMATICS



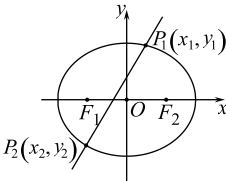




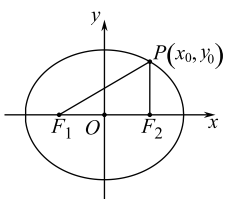
数列的概念与基本性质





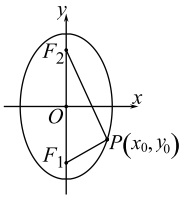

$$|P_1P_2| = \sqrt{(1+k^2)}|x_1-x_2| = \sqrt{(1+k^2)}[(x_1+x_2)^2-4x_1x_2]$$
$$|P_1P_2| = \sqrt{(1+\frac{1}{k^2})}|y_1-y_2| = \sqrt{(1+\frac{1}{k^2})}[(y_1+y_2)^2-4y_1y_2]$$

— 弦长公式


$$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 (a > b > 0)$$
$$|PF_1| = a + ex_0, |PF_2| = a - ex_0$$

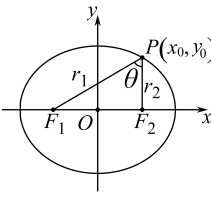
— 公式

焦点在x轴


$$\frac{y^2}{a^2} + \frac{x^2}{b^2} = 1 (a > b > 0)$$
$$|PF_1| = a + ey_0, |PF_2| = a - ey_0$$

— 公式

焦点在y轴

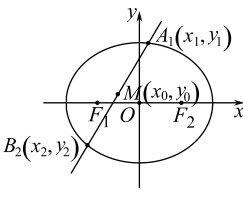

$$S_{\triangle F_1PF_2} = \frac{1}{2}r_1r_2\sin\theta = b^2 \cdot \tan\frac{\theta}{2}$$

— 公式

$$\theta = \arccos\left(\frac{2b^2}{r_1r_2} - 1\right), \theta_{\max} = \arccos\left(\frac{b^2 - c^2}{a^2}\right) (r_1 = r_2)$$

— 备注

焦点三角形


$$k_{AB} = -\frac{b^2x_0}{a^2y_0}$$

— 直线斜率

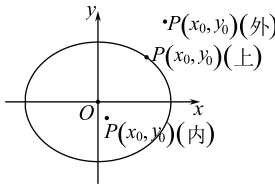
$$y - y_0 = -\frac{b^2x_0}{a^2y_0}(x - x_0)$$

— 直线AB方程

$$y - y_0 = \frac{a^2y_0}{b^2x_0}(x - x_0)$$

— AB垂直平分线方程

解析关系(直线与椭圆)


$$\frac{x_0^2}{a^2} + \frac{y_0^2}{b^2} > 1$$

— 点P在椭圆外

$$\frac{x_0^2}{a^2} + \frac{y_0^2}{b^2} = 1$$

— 点P在椭圆上

$$\frac{x_0^2}{a^2} + \frac{y_0^2}{b^2} < 1$$

— 点P在椭圆内

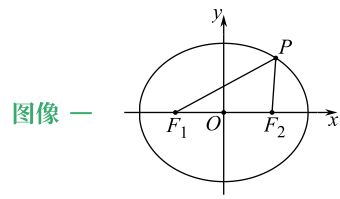
位置关系:(点P与椭圆)

常用结论

椭圆

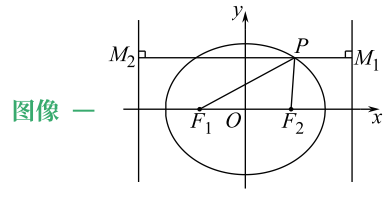
定义

第一定义



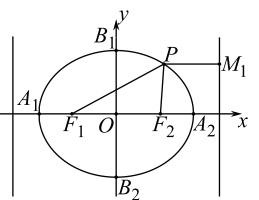
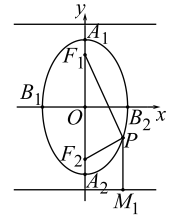
符号语言 — $|PF_1| + |PF_2| = 2a > |F_1F_2|$, $(|F_1F_2| = 2a)$, 的点P的轨迹

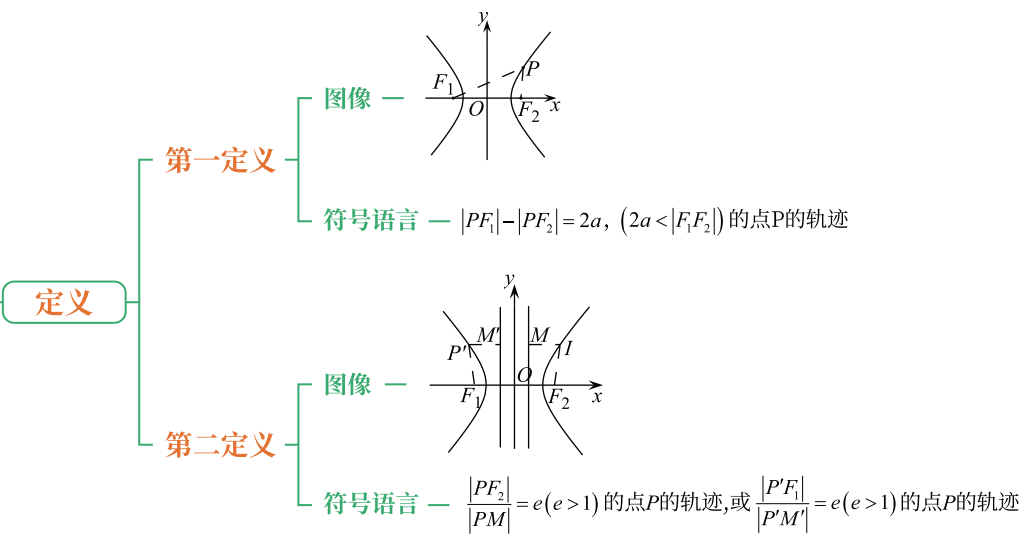
第二定义



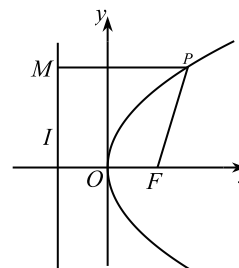
符号语言 — $\frac{|PF_1|}{|PM_1|} = e$, $(0 < e < 1)$ 的点P的轨迹, 或 $\frac{|PF_1|}{|PM_2|} = e$, $(0 < e < 1)$ 的点P的轨迹

几何性质

椭圆	焦点在x轴	焦点在y轴
标准方程	$\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1 (a > b > 0)$	$\frac{y^2}{a^2} + \frac{x^2}{b^2} = 1 (a > b > 0)$
图形		
中心	$O(0, 0)$	
焦点	$(\pm c, 0)$	$(0, \pm c)$
顶点	$A_1(-a, 0), A_2(a, 0), B_1(0, b), B_2(0, -b)$	$A_1(0, a), A_2(0, -a), B_1(-b, 0), B_2(b, 0)$
范围	$ x \leq a, y \leq b$	$ x \leq b, y \leq a$
焦距	$ F_1F_2 = 2c, c^2 = a^2 - b^2$	
长轴、短轴	长轴长 $ A_1A_2 $ 为 $2a$, 短轴长 $ B_1B_2 $ 为 $2b$	
离心率	$e = \frac{c}{a} (0 < e < 1)$	
对称轴	$x = 0, y = 0$	
准线方程	$x = \pm \frac{a^2}{c}$	$y = \pm \frac{a^2}{c}$



双曲线	焦点在x轴	焦点在y轴
标准方程	$\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1 (a > 0, b > 0)$	$\frac{y^2}{a^2} - \frac{x^2}{b^2} = 1 (a > 0, b > 0)$
图形		
中心	$O(0, 0)$	$O(0, 0)$
焦点	$(\pm c, 0)$	$(0, \pm c)$
顶点	$A_1(-a, 0), A_2(a, 0)$	$A_1(0, a), A_2(0, -a)$
范围	$x \geq a, x \leq -a$	$y \geq a, y \leq -a$
焦距	$ F_1F_2 = 2c (c > 0), c^2 = a^2 + b^2$	
实轴虚轴	实轴长 $2a$, 虚轴长 $2b$, 焦点在实轴上	
离心率	$e = \frac{c}{a} (e > 1)$	
对称轴	x轴, y轴	
准线方程	$x = \pm \frac{a^2}{c}$	$y = \pm \frac{a^2}{c}$
渐近线方程	$y = \pm \frac{b}{a}x$	$y = \pm \frac{a}{b}x$



— 图像

— **备注** — $F \notin l$ (当 $F \in l$, 为过点 F 的 l 的垂线)

定义

抛物线

几何性质

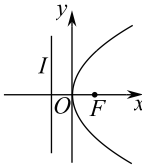
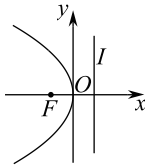
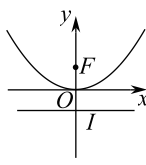
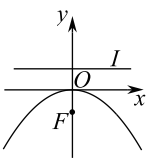
常用结论

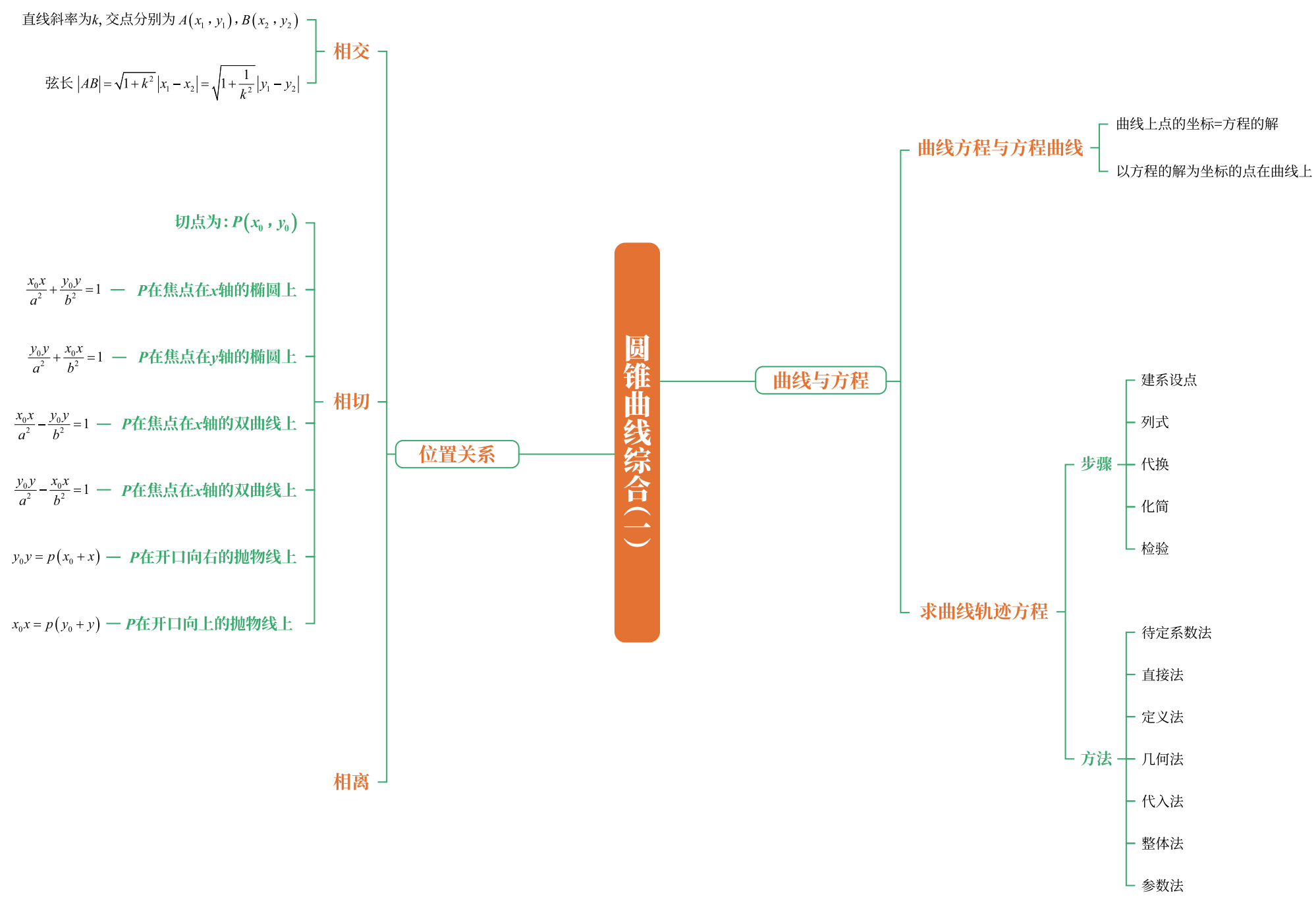
解析关系 (直线与抛物线)

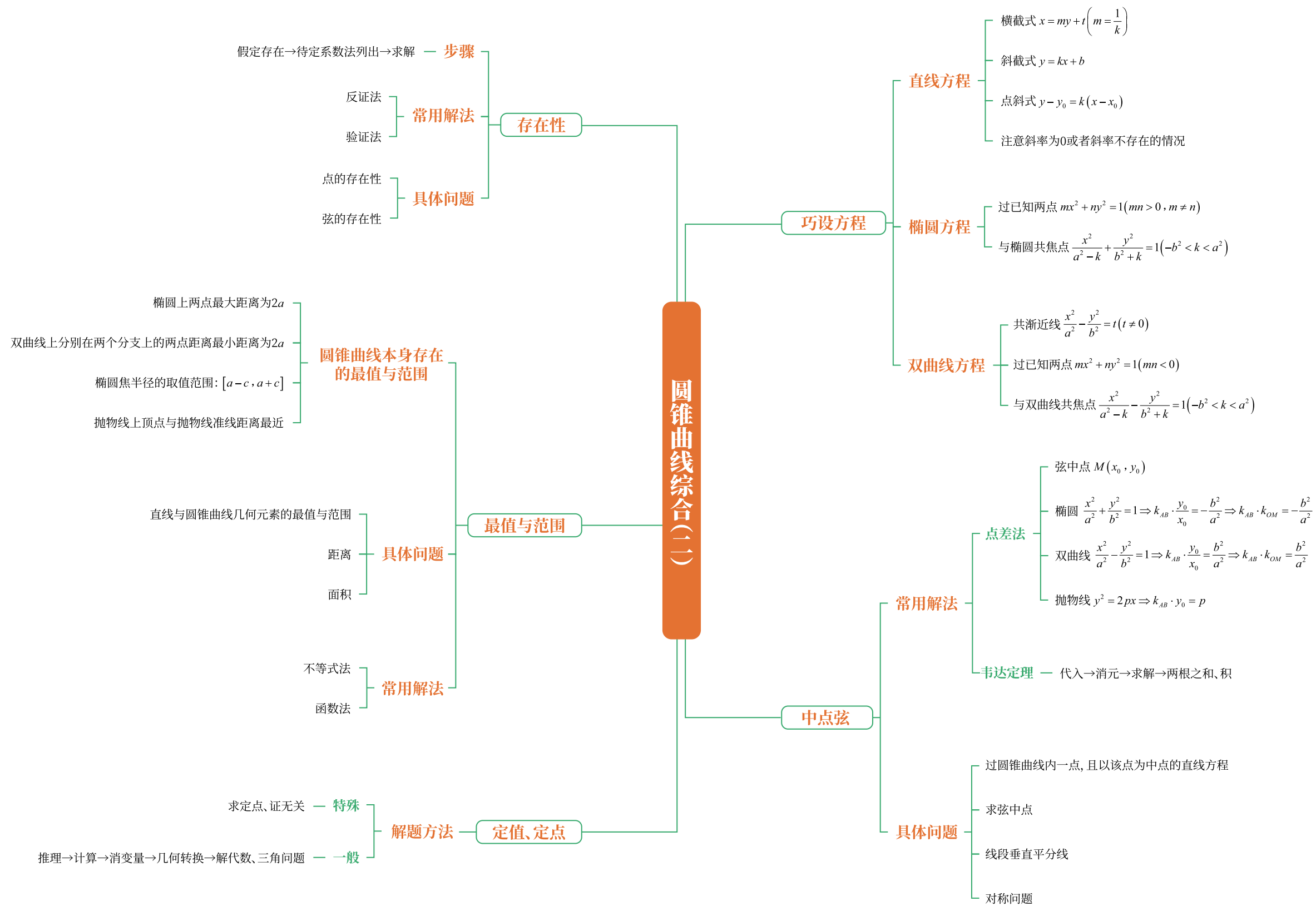
 $(x - x_0)$ — 直线AB方程
$$y - y_0 = -\frac{y_0}{p}(x - x_0) \quad \text{—— 直线AB的垂直平分线方程}$$

位置关系:(点 P 与抛物线)
 $y^2 = 2px (p > 0)$

备注:含焦点

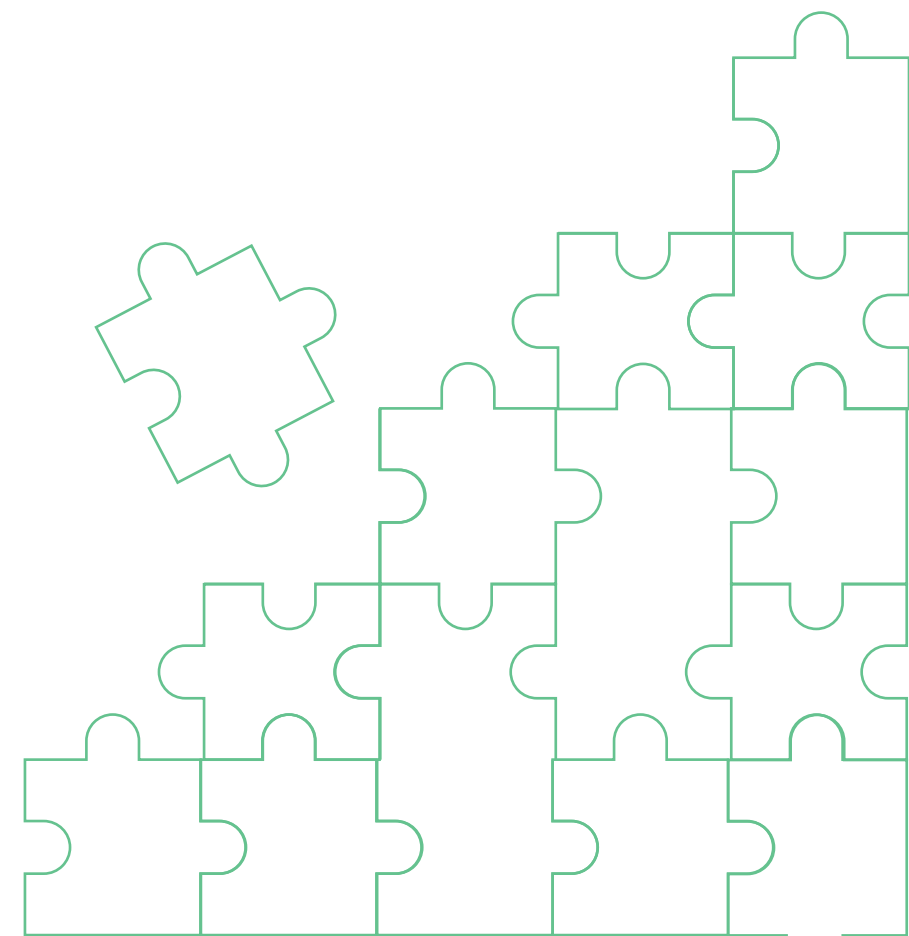
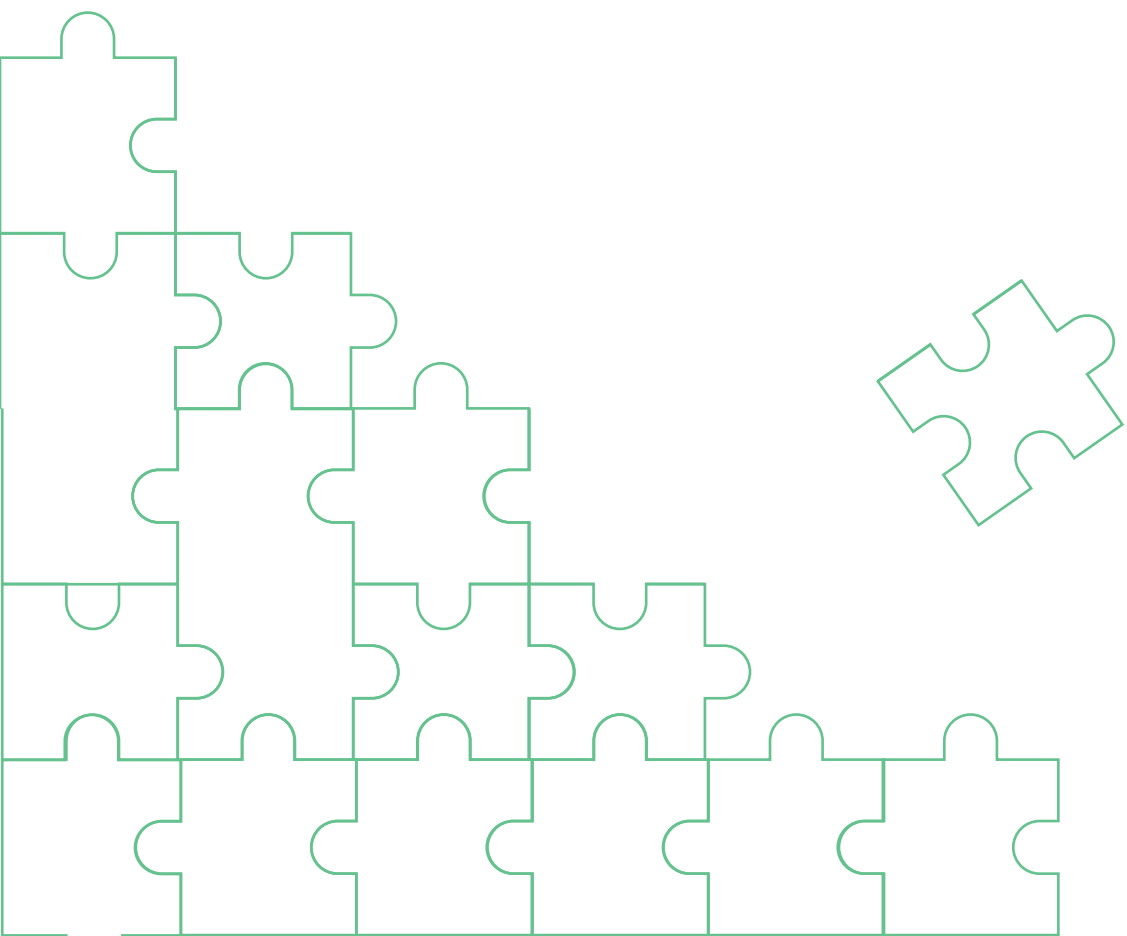
抛物线	焦点在x轴正半轴	焦点在x轴负半轴	焦点在y轴正半轴	焦点在y轴负半轴
标准方程	$y^2 = 2px (p > 0)$	$y^2 = -2px (p > 0)$	$x^2 = 2py (p > 0)$	$x^2 = -2py (p > 0)$
图形				
焦点	$F\left(\frac{p}{2}, 0\right)$	$F\left(-\frac{p}{2}, 0\right)$	$F\left(0, \frac{p}{2}\right)$	$F\left(0, -\frac{p}{2}\right)$
准线	$x = -\frac{p}{2}$	$x = \frac{p}{2}$	$y = -\frac{p}{2}$	$y = \frac{p}{2}$
对称轴	x轴	x轴	y轴	y轴
焦半径	$x_0 + \frac{p}{2}$	$\frac{p}{2} - x_0$	$\frac{p}{2} + y_0$	$\frac{p}{2} - y_0$
离心率	$e = 1$	$e = 1$	$e = 1$	$e = 1$
范围	$x \geq 0$	$x \leq 0$	$y \geq 0$	$y \leq 0$
顶点	$O(0, 0)$	$O(0, 0)$	$O(0, 0)$	$O(0, 0)$
通径	$2p$	$2p$	$2p$	$2p$

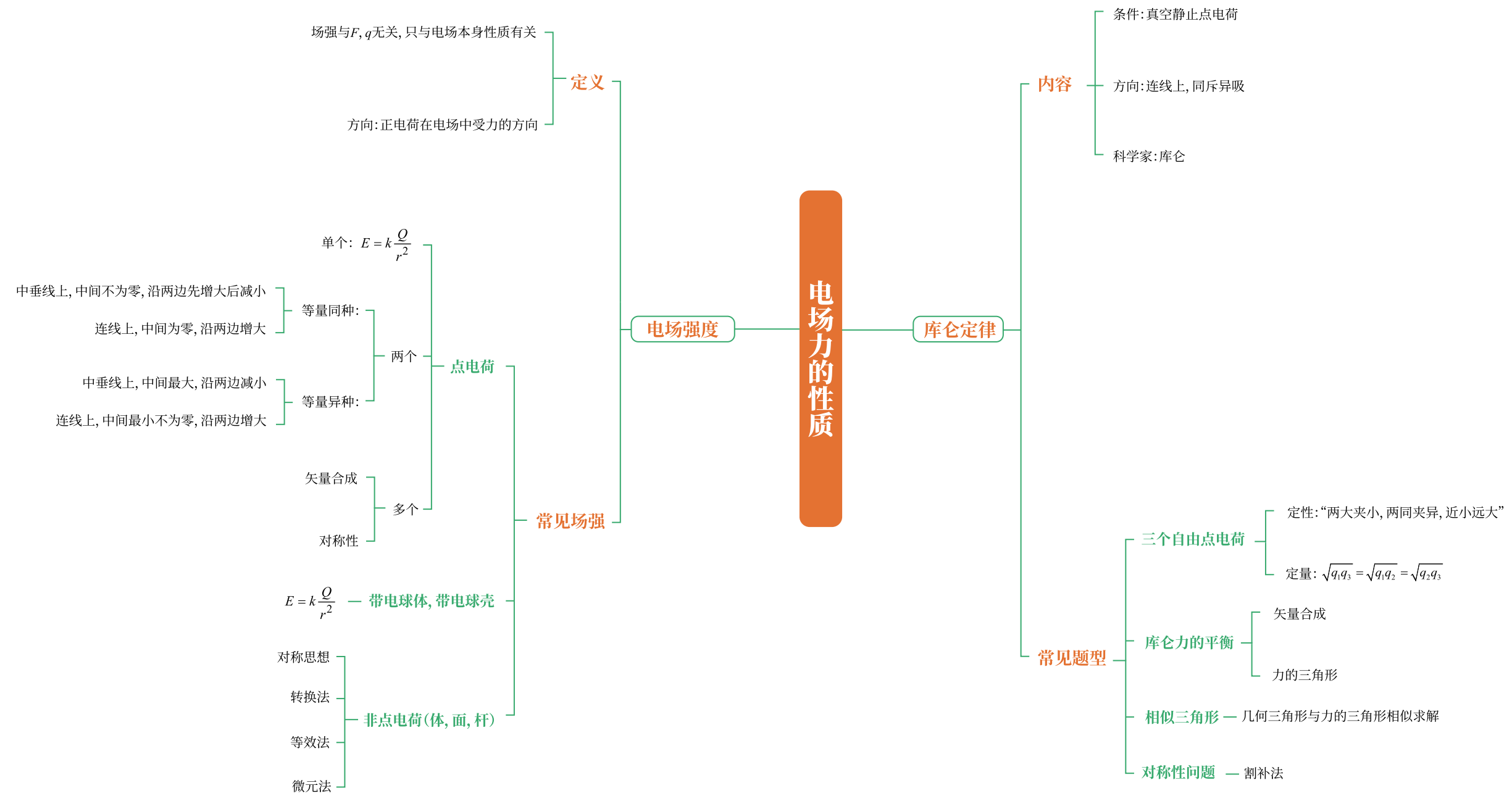


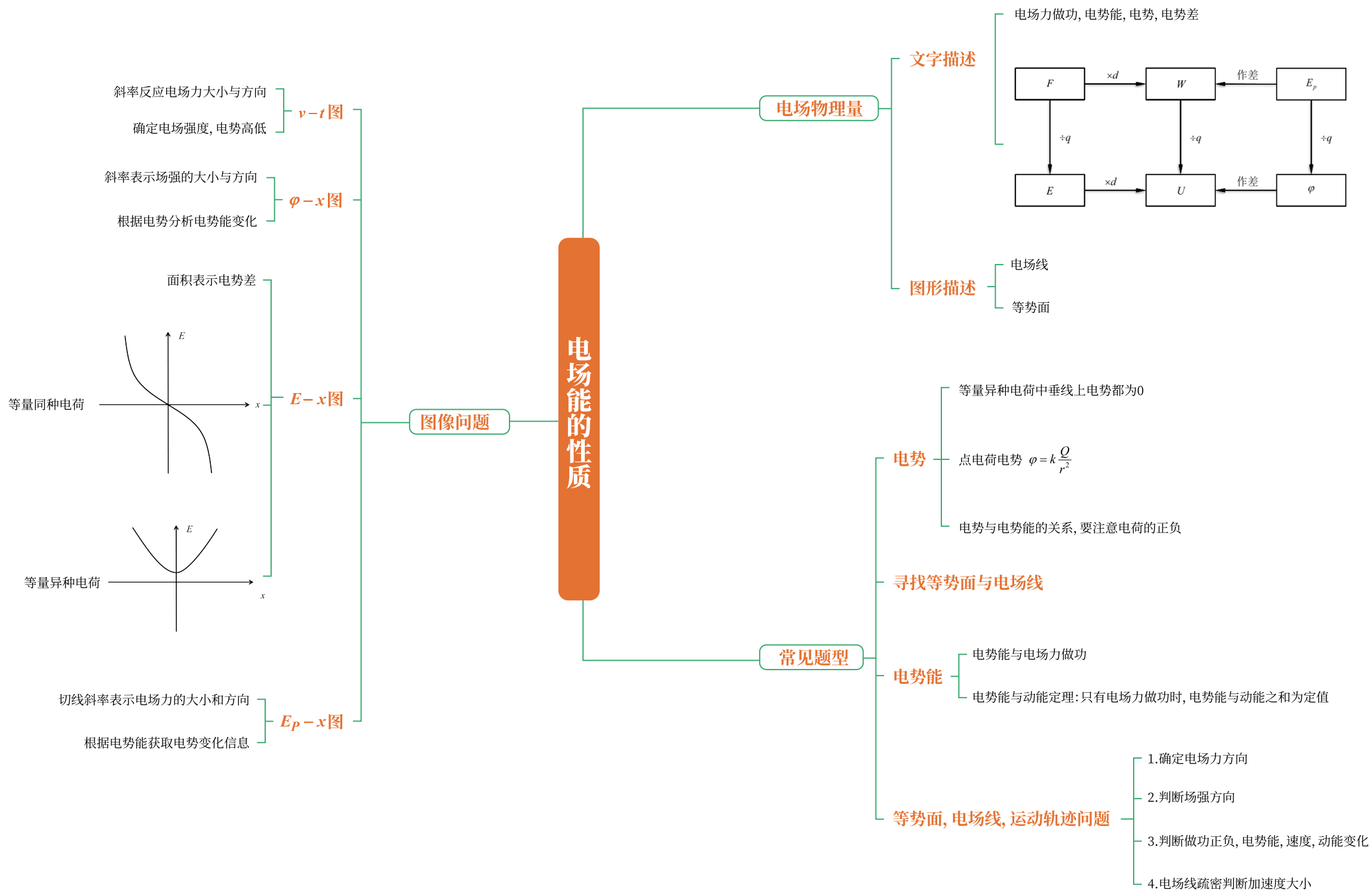


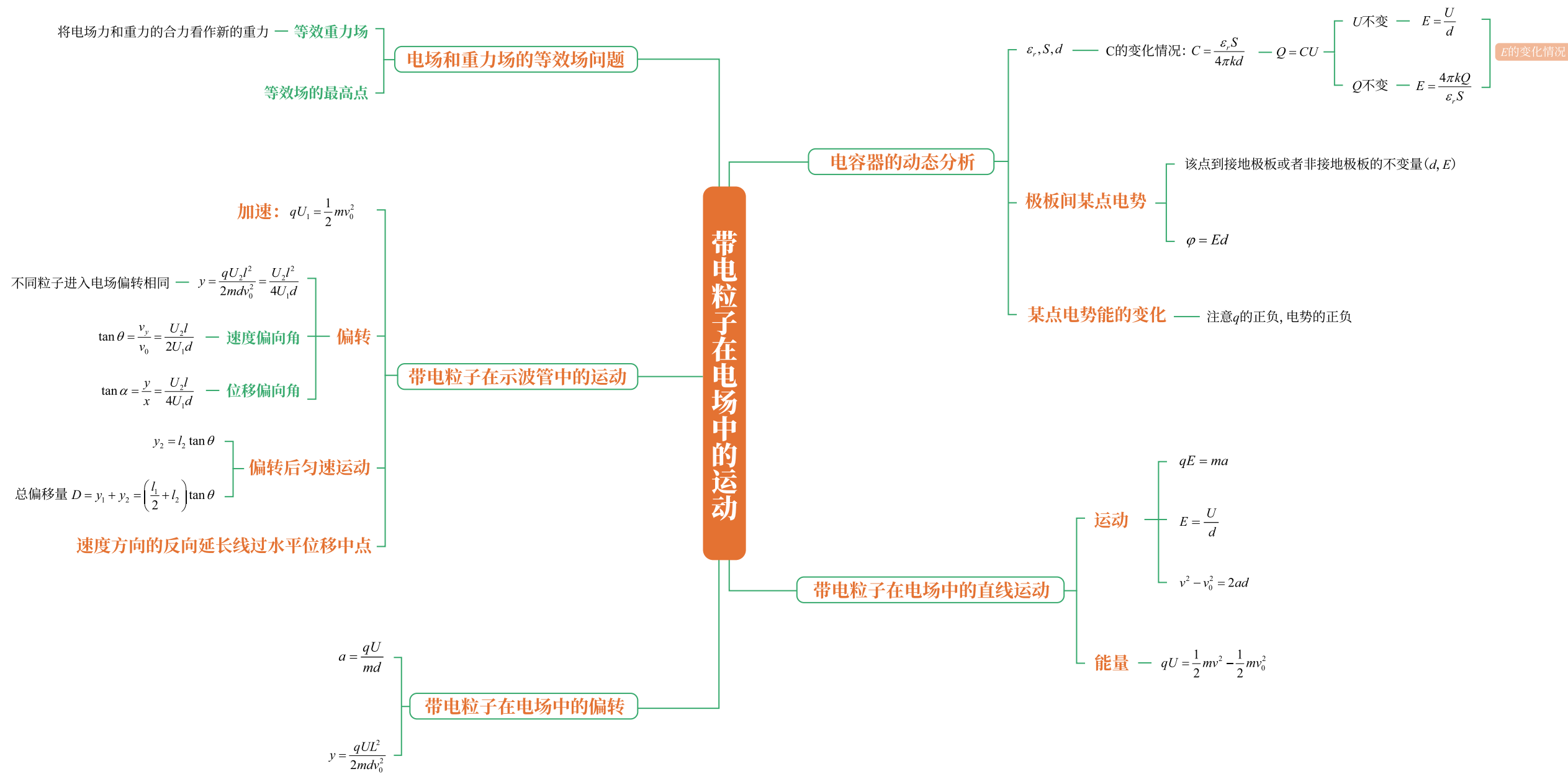
高二·物理篇

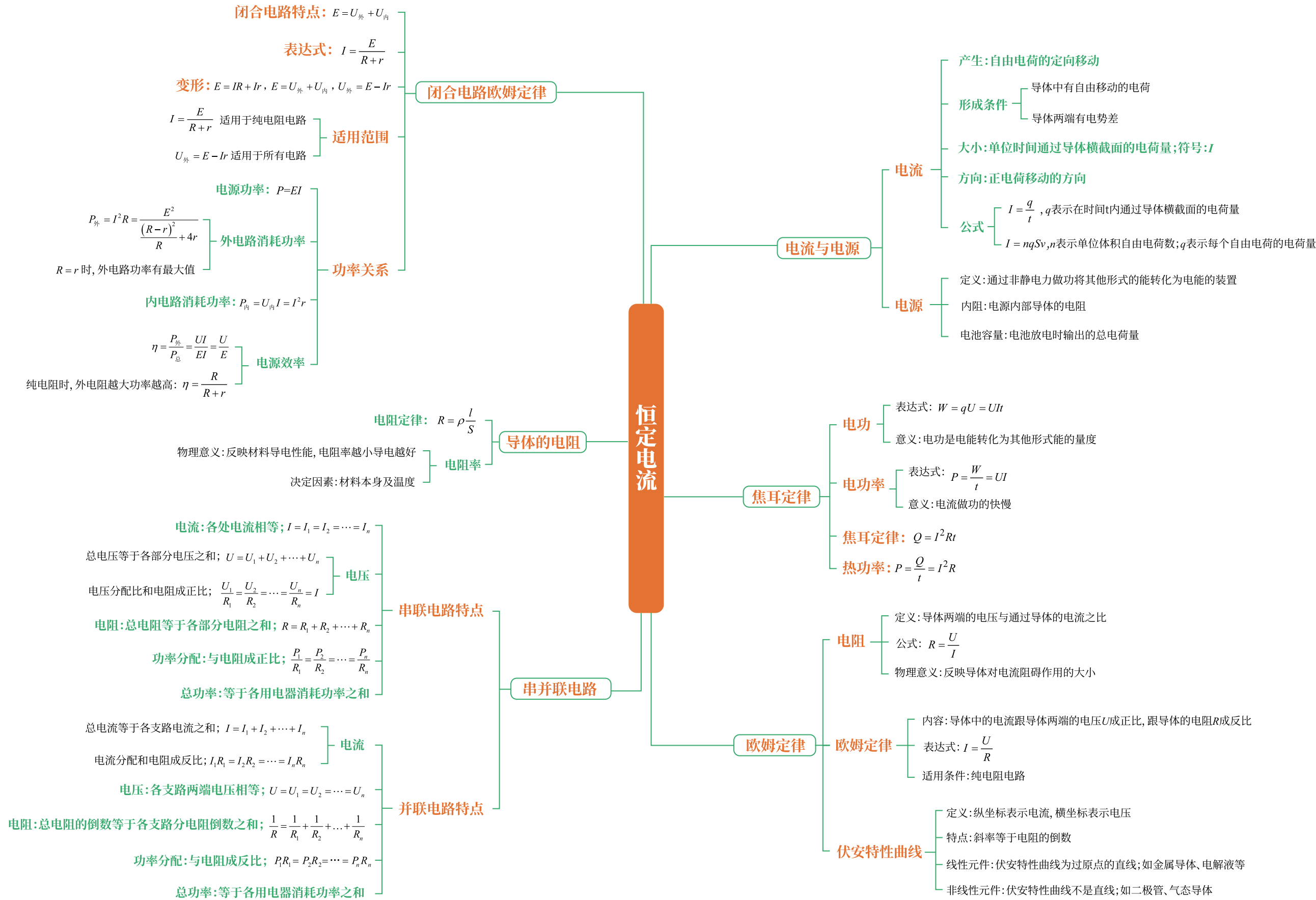
PHYSICS

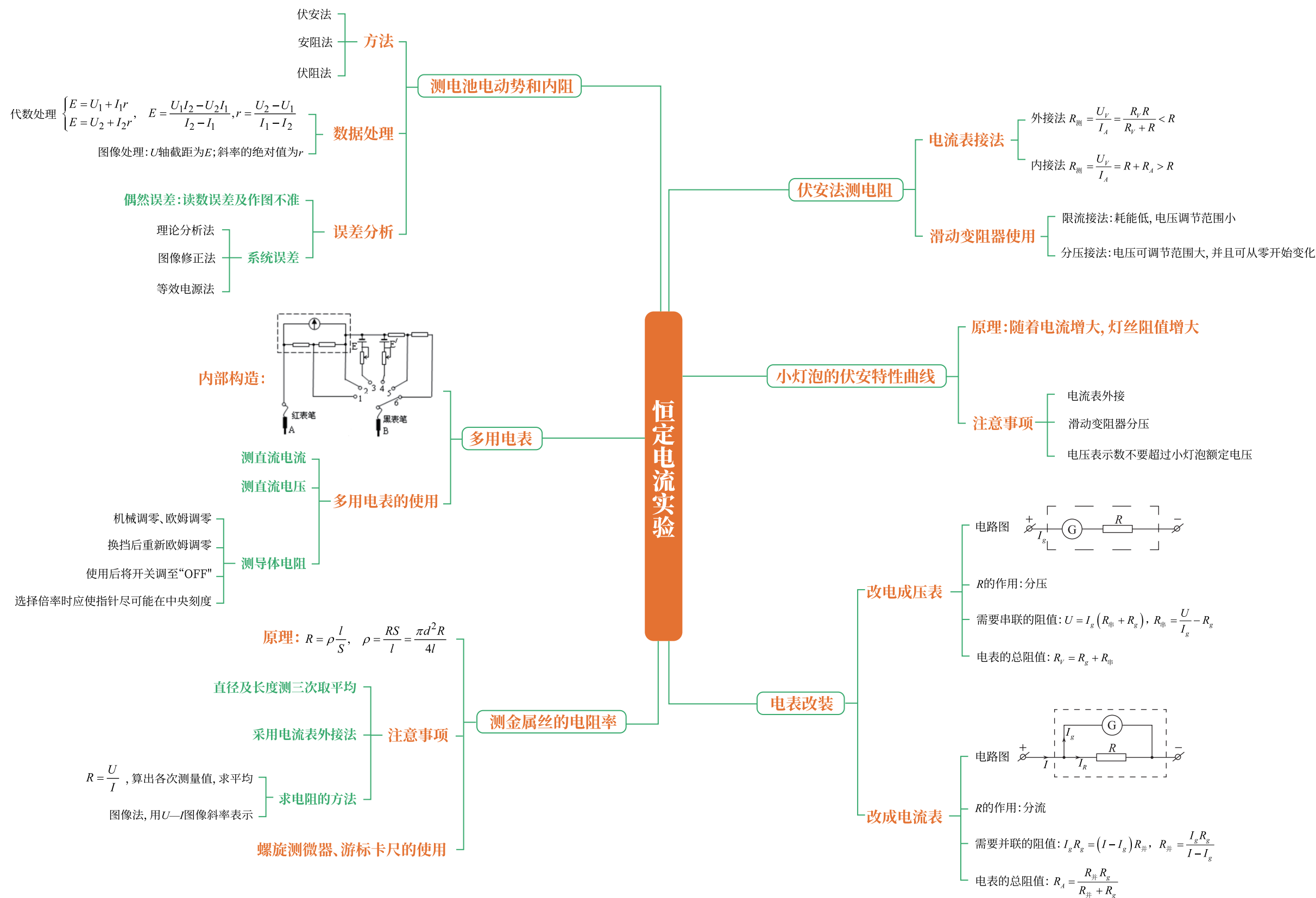


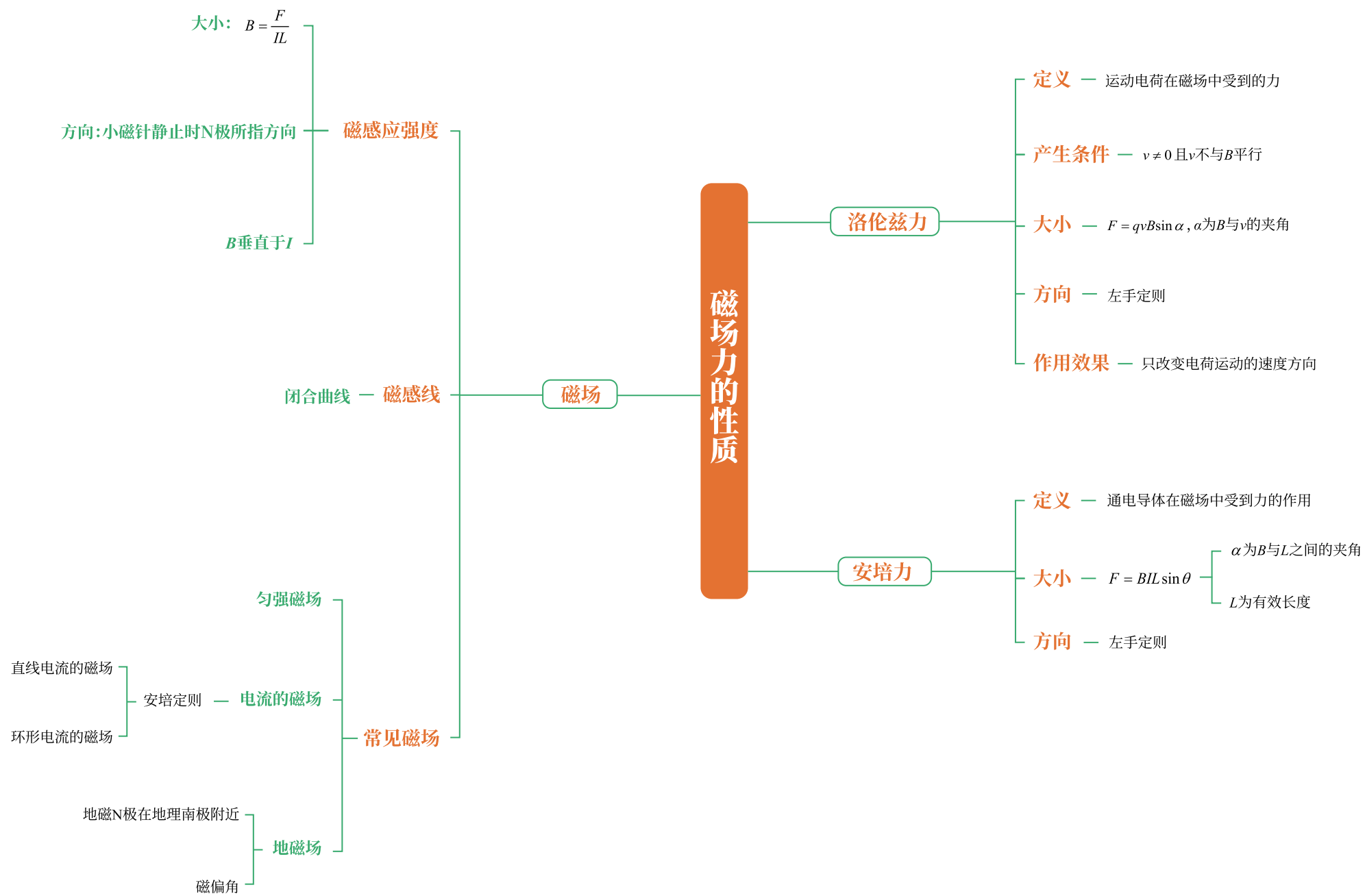


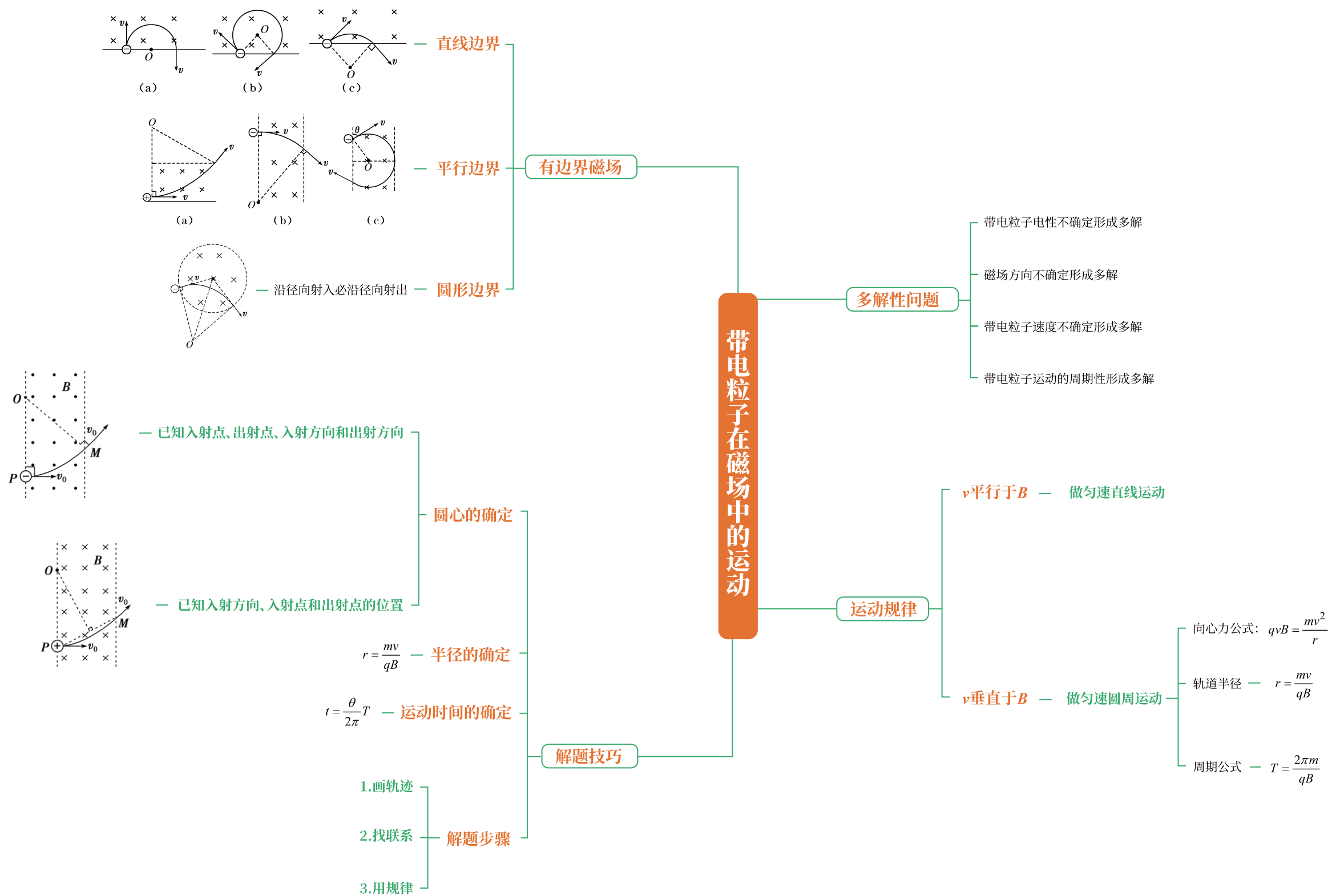


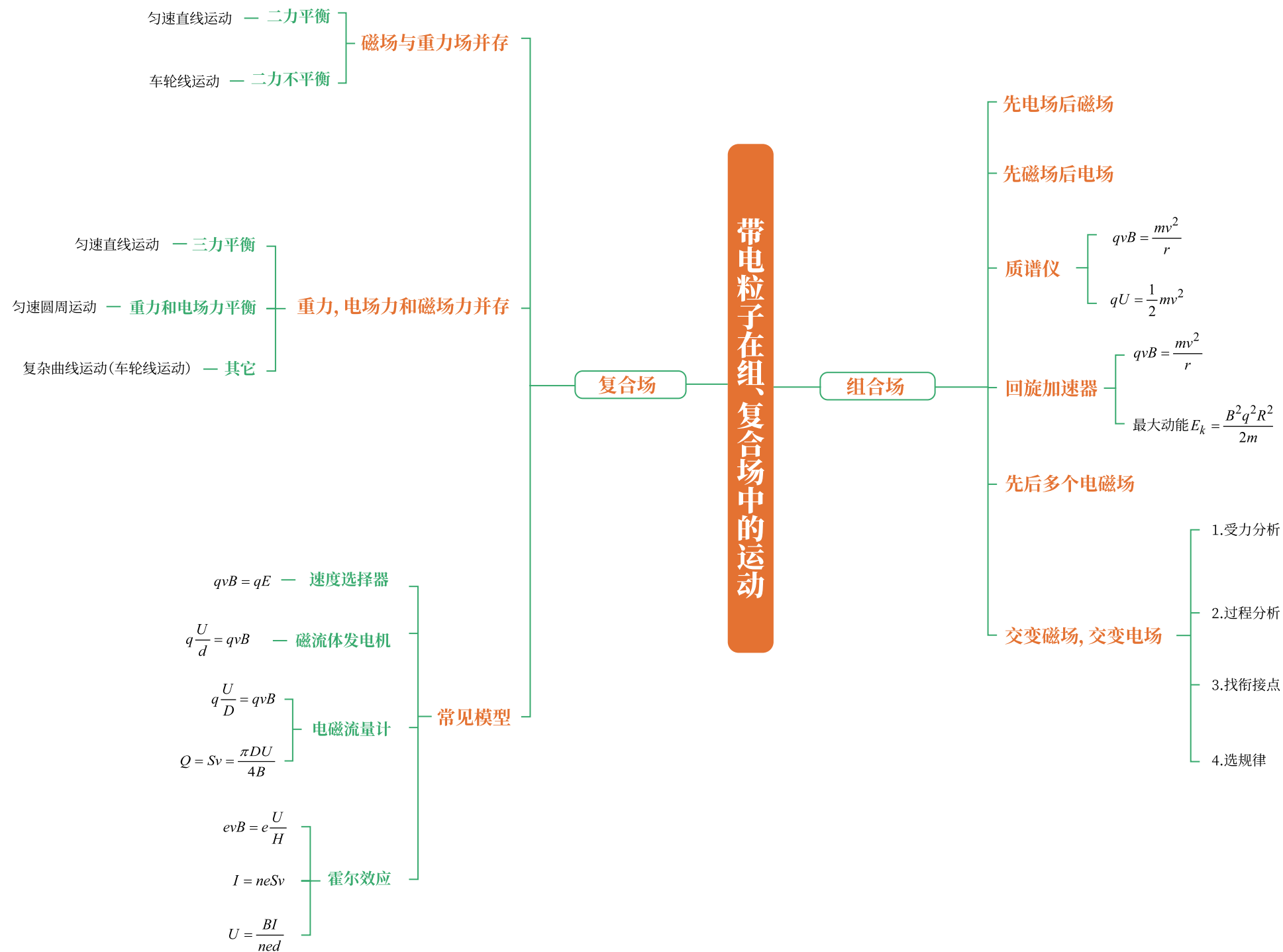


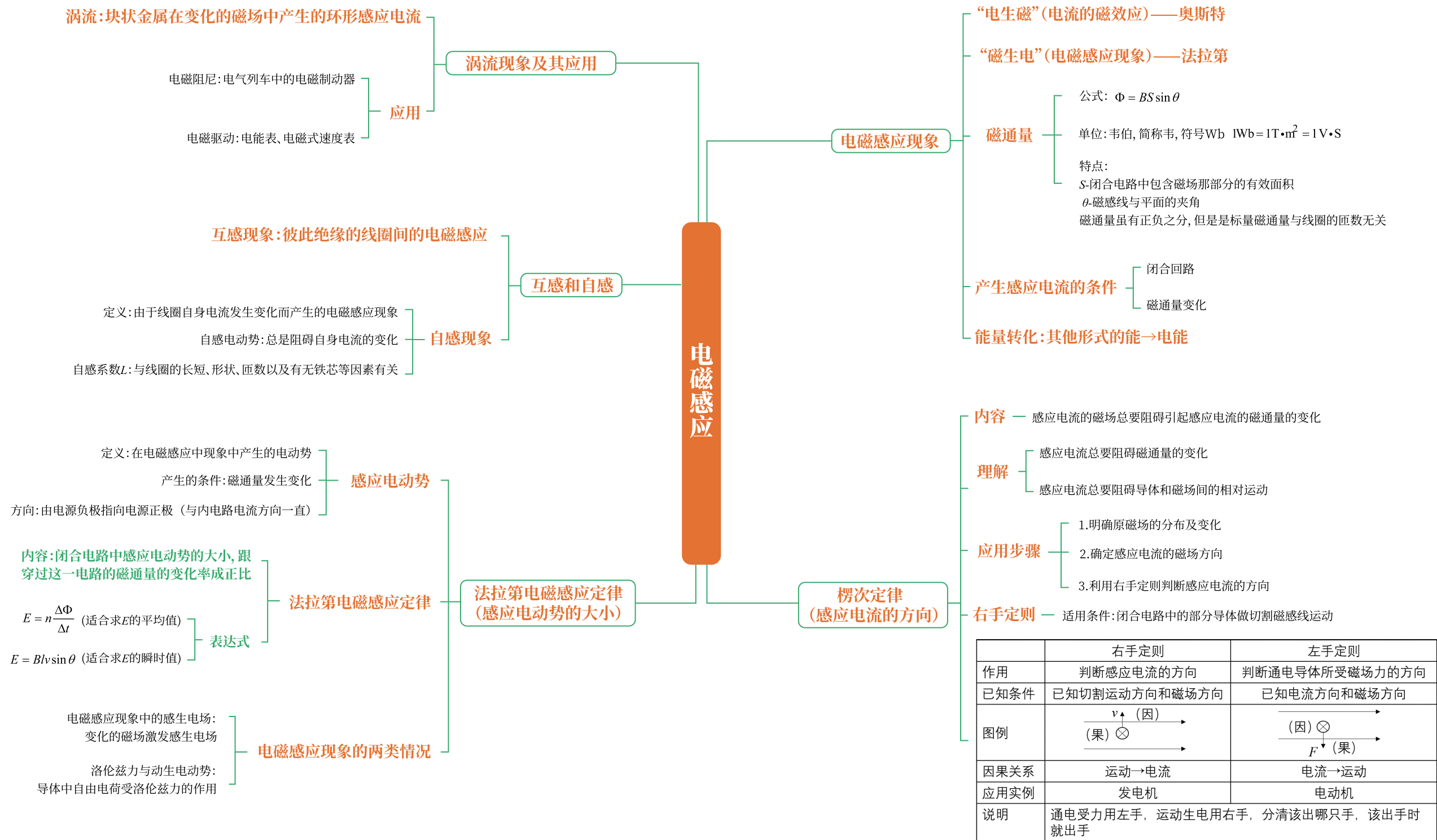


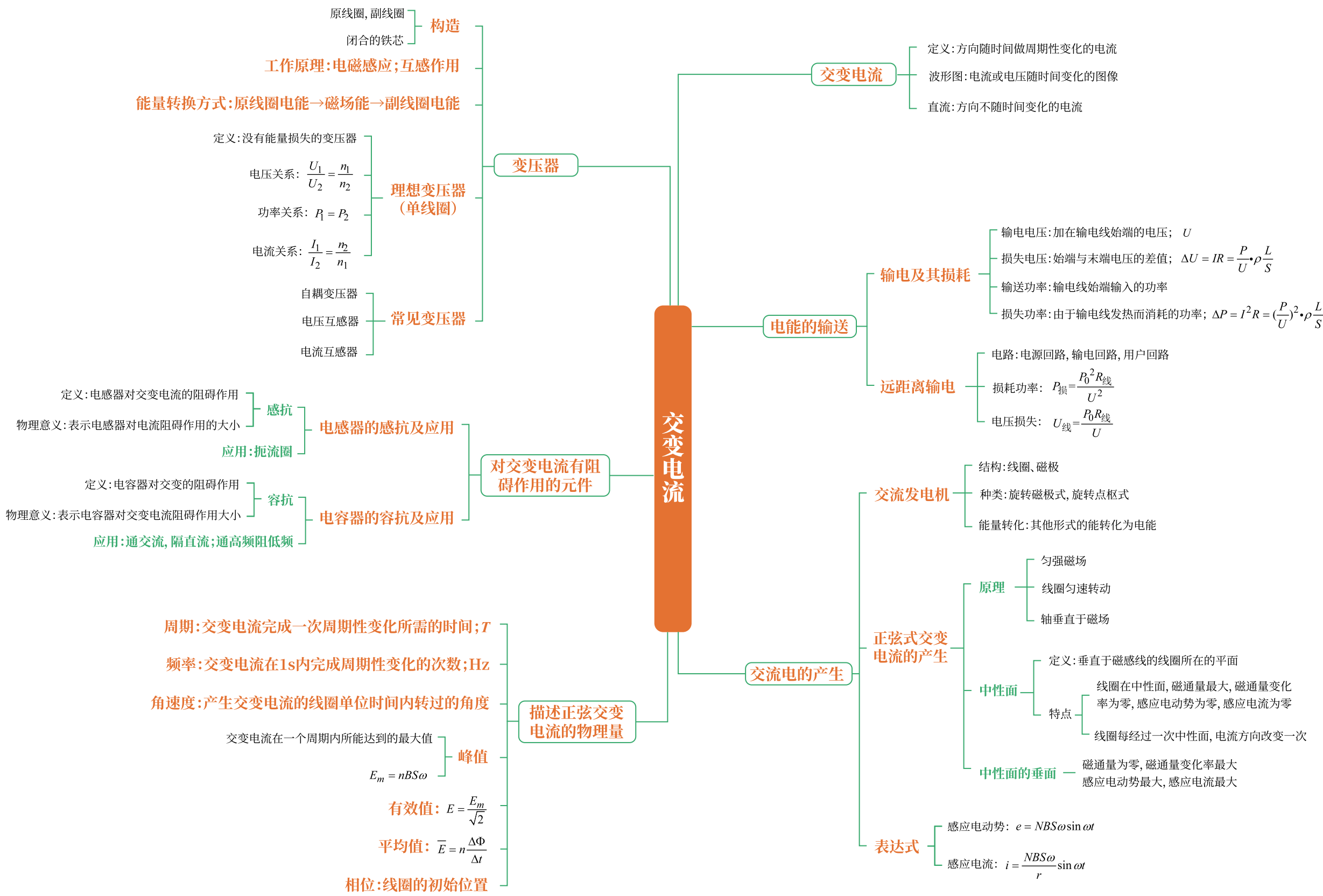


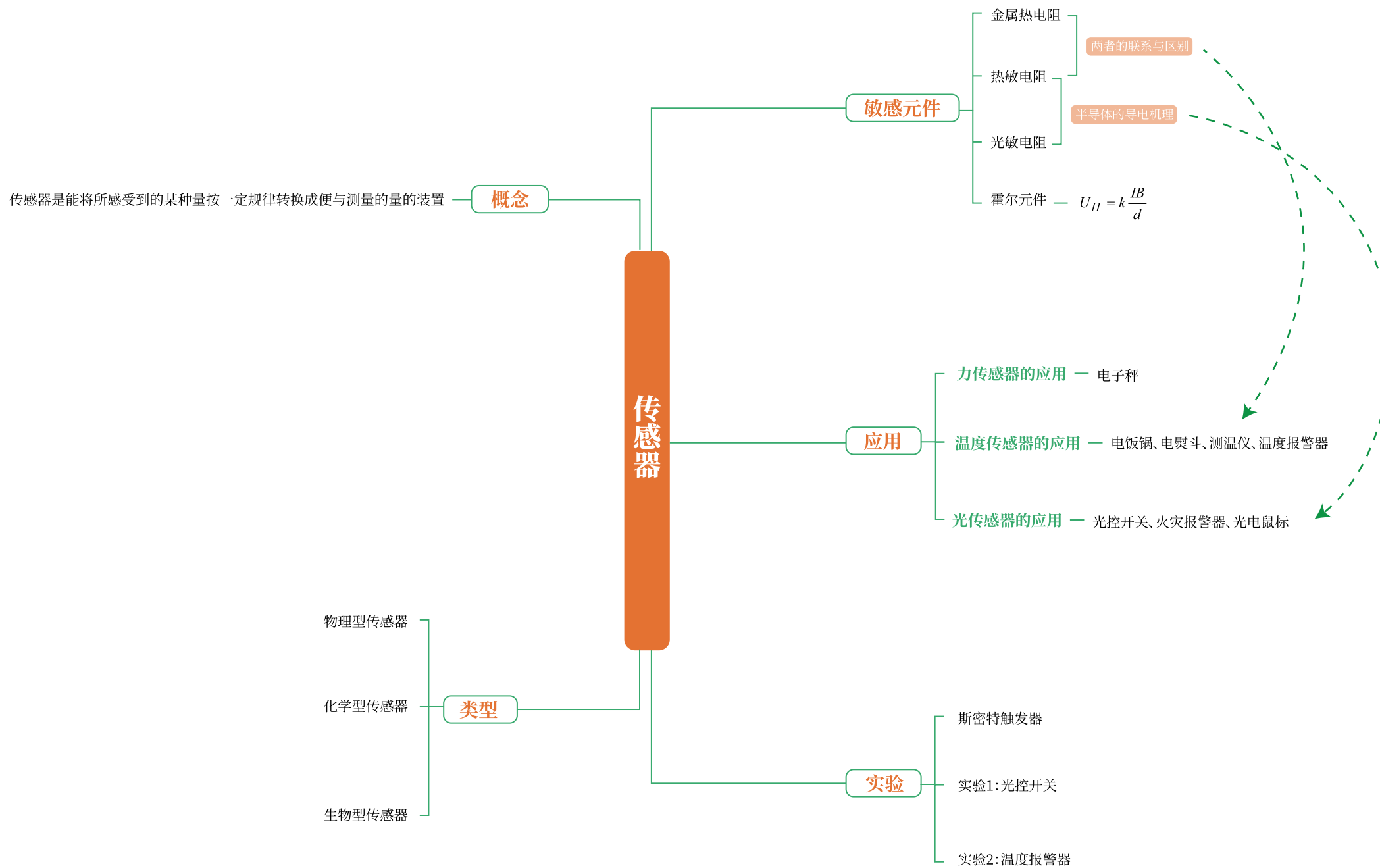












高二·化学篇

CHEMISTRY

