刷练22

1. A　初：$9000\times 60\%=5400$　高：$9000\times 40\%=3600$

初近：$5400\times 40\%=2160$　高近：$3600\times 50\%=1800$ => 选对了就走，其他不看

D. 假设是45%，$9000\times 45\%=4050\neq 2160+1800$，故D不对

2. C　A. 从下往上数✓ B. 注意"正数""负数"和"零"✓

C. 不要算，先看D.　D. 分数时，故C错

3. D.　$|\vec{OP}|=|\vec{OP_1}|=2$，$\vec{OP}\cdot\vec{OP_1}=|\vec{OP}|\cdot|\vec{OP_1}|\cos 30^\circ=2\times 2\times\frac{\sqrt3}{2}=2\sqrt3$

4. B.　$\frac12 bc\sin A=\sqrt3$　$a^2=b^2+c^2-2bc\cos A=1+16-2\cdot1\cdot4\cdot\frac12=17-4=13$，$a=\sqrt{13}$

$\frac12\cdot1\cdot c\cdot\frac{\sqrt3}{2}=\sqrt3$ => $c=4$.

5. D　$\left(\frac{\overrightarrow{AB}}{|\overrightarrow{AB}|}+\frac{\overrightarrow{AC}}{|\overrightarrow{AC}|}\right)\cdot\overrightarrow{BC}=0$，　$\frac{\overrightarrow{AB}\cdot\overrightarrow{AC}}{|\overrightarrow{AB}||\overrightarrow{AC}|}=\frac12=\frac{|\vec{AB}|\cdot|\vec{AC}|\cdot\cos A}{|\vec{AB}|\cdot|\vec{AC}|}=\cos A$ => $A=\frac{\pi}{3}$ => 等边

角平分线向量 ⊥ BC => 等腰

6. D.　$(\cos\alpha-\sin\alpha)^2=\frac14$　$\tan(\alpha-\frac{\pi}{4})=\frac{\sin(\alpha-\frac{\pi}{4})}{\cos(\alpha-\frac{\pi}{4})}=\frac{\sin\alpha\cos\frac{\pi}{4}-\cos\alpha\sin\frac{\pi}{4}}{\cos\alpha\cos\frac{\pi}{4}+\sin\alpha\sin\frac{\pi}{4}}=\frac{\cancel{\frac{\sqrt2}{2}}(\sin\alpha-\cos\alpha)}{\cancel{\frac{\sqrt2}{2}}(\cos\alpha+\sin\alpha)}$

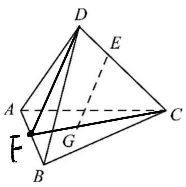
$\cos^2\alpha+\sin^2\alpha-2\sin\alpha\cos\alpha=\frac14$　$\tan^2(\alpha-\frac{\pi}{4})=\frac{(\cos\alpha-\sin\alpha)^2}{(\cos\alpha+\sin\alpha)^2}=\frac{\frac14}{\cos^2\alpha+\sin^2\alpha+2\sin\alpha\cos\alpha}=\frac{\frac14}{1+\frac34}=\frac{\frac14}{\frac74}=\frac17$

$1-2\sin\alpha\cos\alpha=\frac14$

$2\sin\alpha\cos\alpha=\frac34$

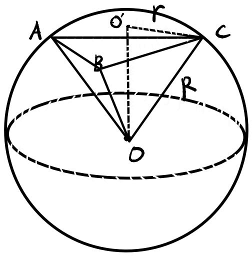
$\sin\alpha\cos\alpha=\frac38$　∴原式 $=\frac38\div\frac17=\frac38\times7=\frac{21}{8}$

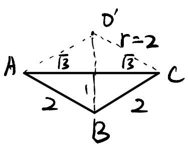
7. A.



等边三角形四心合一，G为CF三等分点 => EG // DF => DF与BD夹角30°

8. D.

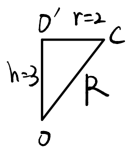




$V=\frac13 Sh=\sqrt3$

$\frac13\cdot\sqrt3\cdot h=\sqrt3$

$h=3$



$R^2=9+4=13$

$R=\sqrt{13}$

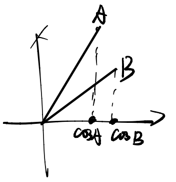
9. CD.　A. $\vec a\,\vec b$ 夹角钝角 => $\vec a\cdot\vec b<0$ 且 $\vec a$ 与 $\vec b$ 不共线

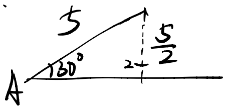
B. $|\vec a|=\sqrt{k^2+4}$　当 $k=0$，$|\vec a|_{min}=2$

C. 两个，$\pm\frac{\vec a}{|\vec a|}$

D. $|\vec a|=2|\vec b|$ => $|\vec a|^2=4|\vec b|^2$ => $k^2+4=4\times2$ => $k=\pm2$

10. ACD

A. 

B. 

$a=2<\frac{5}{2}$ 无解

C. $\cos A\cos B\cos C>0$, 锐 ×

$\underbrace{\cos A \cos B}_{不排除出现两钝角}$

D. $\sin A=\sin(B+C)=\sin B\cos C+\cos B\sin C$

$a-c\cdot\cos B=a\cdot\cos C$

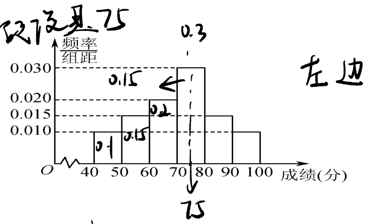
$\sin A-\cos B\sin C=\sin A\cos C$

$\sin B\cos C+\cos B\sin C-\cos B\sin C=\sin A\cos C$

$\sin B\cos C=\sin A$

11. AC A ✓ B. $0.25\times4000=1000$人 ⊗ C. 略算 见图 D.

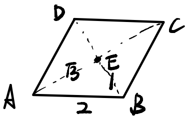
D. 假设是75



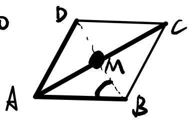
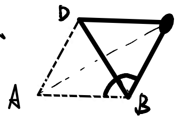
左边频率 $=0.6>0.5$ 故错

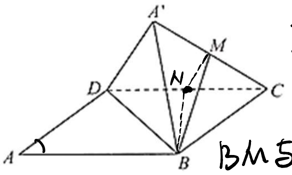
∵多选 ∴AC ✓

12. ABD "六芒"模型



A. $V_{A'-BCD\,max}=\frac{1}{3}S_{\triangle BCD}\cdot A'E=\frac{1}{3}\cdot\sqrt{3}\cdot\sqrt{3}=1$ ✓

B. 初  ⇒ 末  M(M, A', C 重合)

C. 

取CD中点N

$MN \underline{\parallel} \frac{1}{2}A'D$

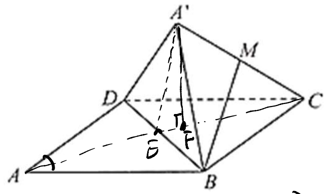
BM与A'D夹角

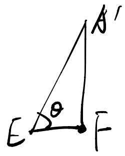
⇒ MN与BM夹角

⇒在△MNB中，MN与BM定值，BM动值，3边不固定，根据余弦定理，夹角为动值

CD∥AB，CD ⇒ AB与BM夹角 ⇒锐→钝↑

故存在AB⊥BM

D. 

⇒ 

$\cos\theta=\frac{EF}{A'E}=\frac{EF}{\sqrt{3}}=\frac{1}{2}$

$\Rightarrow EF=\frac{\sqrt{3}}{2}=\frac{1}{2}CE$

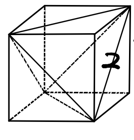
F为CE三等分点，CE为中线

又∵在A'-BCD中，$A'D=A'B=BD=BC=CD$，

A'的垂足F为△BCD中心

∴A'-BCD为正四面体，棱长为2，求它外接球

故在正方体中求



$\Rightarrow 2R=\sqrt{2+2+2}=\sqrt{6}$

$R=\frac{\sqrt{6}}{2}$

13. 2080

高三：$260-85\times2=260-170=90$

$90\sim120$

$1\sim8$

$\Rightarrow 260\sim?\Rightarrow 260\times8=2080$

14. $|2\vec{a}-\vec{b}|^2=4\vec{a}^2+\vec{b}^2-4\vec{a}\cdot\vec{b}=25$

$16+3-4\vec{a}\cdot\vec{b}=25$

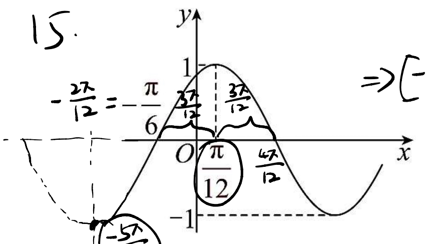
$-4\vec{a}\cdot\vec{b}=6$

$2\vec{a}\cdot\vec{b}=-3$

$|\vec{a}+3\vec{b}|=\sqrt{(\vec{a}+3\vec{b})^2}=\sqrt{|\vec{a}|^2+9|\vec{b}|^2+6\vec{a}\cdot\vec{b}}$

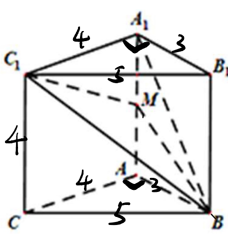
$=\sqrt{4+27-9}$

$=\sqrt{22}$

15. 

$\Rightarrow[-\frac{5\pi}{12},\frac{\pi}{12}]\uparrow \Rightarrow [-\frac{5\pi}{12}+k\pi,\frac{\pi}{12}+k\pi]\ (k\in Z)$

$T=\pi$

16. 

$A_1-MBC_1\Rightarrow C_1-A_1MB$

$V=\frac{1}{3}\cdot S_{A_1MB}\cdot A_1C_1$

$=\frac{1}{3}\cdot(\frac{1}{2}\cdot2\cdot3)\cdot4=4$