2019

一、选择题：本大题共 12 小题，每小题 5 分，共 60 分.

	1	2	3	4	5	6	7	8	9	10	11	12
	A	C	D	A	B	B	A	B	B	D	C	D

二、填空题：本大题共 4 小题，每小题 5 分，共 20 分.

13. 8　　14. $-\frac{7}{4}$　　15. $-\frac{1}{4}$　　16. $\frac{2\sqrt{5}}{5}$

三、解答题：

17. (本小题满分 12 分)

( )　$=1$　$_1=1$　$_1=6$.

≥ 2　$=2\ _{-1}+2\ \ -1$

$=\ \ +2\ \ +3=2\ _{-1}+2\ \ -1+2\ \ +3=2(\ _{-1}+2\ \ +1)=2\left[\ _{-1}+2(\ \ -1)+3\right]$

$=2\ _{-1}$

$\{\ \}$　6　2　.　……………………….6

( )　( )　$=3\times 2$　$=\ \ -2\ \ -3=3\times 2\ \ -2\ \ -3$

$=3\left(2+2^2+\cdots+2\ \right)-2\left(1+2+\cdots+\ \ \right)-3\ =3\cdot\frac{2\left(1-2\ \right)}{1-2}-\ (\ \ +1)-3$

$=3\times 2^{\ +1}-\ ^{2}-4\ \ -6$.　…………………………12

18. (本小题满分 12 分)

( )

	100	24	124
	50	26	76
	150	50	200

$^2=\frac{200\times\left(100\times 26-50\times 24\right)^2}{150\times 50\times 124\times 76}=\frac{9800}{1767}\approx 5.546>5.024$

97.5%　.　…………………………….6

( )　1　$\frac{2}{3}$

B　4　$\frac{2}{3}$

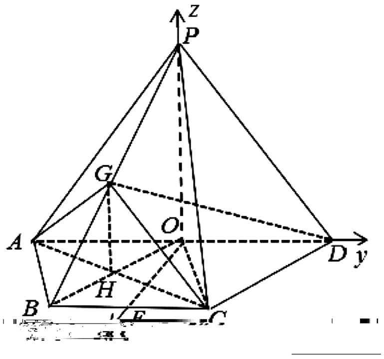
	0	1	2	3	4
	$\frac{1}{81}$	$\frac{8}{81}$	$\frac{24}{81}$	$\frac{32}{81}$	$\frac{16}{81}$

( )$=4\times\frac{2}{3}=\frac{8}{3}$.　…………………………12

19. (本小题满分 12 分)

( ) AD O OP OB OC. OB AC H GH.

$= \quad = \quad = \frac{1}{2}$



ABCO OBCD

OB AC $\perp$.

$\because \Delta$

$\therefore \quad \perp$

$\because \quad \perp \quad \cap \quad =$

$\subset \quad \perp$

$\therefore \quad \perp$

$\subset \quad \perp$

OB PB

$\perp$

$\cap \quad = \quad \perp$. ……………………….6

( ) BC E 0

$-$.

AD=4 (0 0 $2\sqrt{3}$) (0 -2 0) ($\sqrt{3}$ 1 0) (0 2 0) $\left(\frac{\sqrt{3}}{2} \ -\frac{1}{2} \ \sqrt{3}\right)$.

$\overrightarrow{\quad} = (0 \ \ 2 \ \ 2\sqrt{3})$ $\overrightarrow{\quad} = \left(\frac{\sqrt{3}}{2} \ \frac{3}{2} \ \sqrt{3}\right)$.

PAG $\vec{\ } = (\quad)$.

$\begin{cases} \vec{\ }\cdot\overrightarrow{\quad} = 0 \\ \vec{\ }\cdot\overrightarrow{\quad} = 0 \end{cases} \Rightarrow \begin{cases} 2 \ + 2\sqrt{3} \ = 0 \\ \frac{\sqrt{3}}{2} \ + \frac{3}{2} \ + \sqrt{3} \ = 0 \end{cases} \Rightarrow \begin{cases} = -\sqrt{3} \\ = \end{cases}$. $= 1$ $\vec{\ } = \left(1 \ -\sqrt{3} \ \ 1\right)$.

( ) AGC $\overrightarrow{\quad} = \left(-\sqrt{3} \ \ 1 \ \ 0\right)$.

$- \quad - \quad \theta$ $\cos\theta = -\left|\frac{\vec{\ }\cdot\overrightarrow{\quad}}{|\vec{\ }||\overrightarrow{\quad}|}\right| = -\frac{2\sqrt{3}}{2\sqrt{5}} = -\frac{\sqrt{15}}{5}$ ……………..12

20. (本小题满分 12 分)

( ) $\begin{cases} = 1 \\ 4 \ = 8 \end{cases}$ $\begin{cases} = 1 \\ = 2 \end{cases}$ $^2 = 3$

C $\frac{^2}{4} + \frac{^2}{3} = 1$. ……………………………….6

( )

.

: $=$ (-1) ($\neq 0$) : $= -$ ($+$) ( ) ( ) ( )

( ).

$\left(3+4 \ ^2\right) \ ^2 + 8 \ ^2 \ + 4\left(\ ^2 \ ^2 - 3\right) = 0$

$+ \quad = -\frac{8\ \ ^2}{3+4\ \ ^2}$ $\quad = \frac{4(\ \ ^2\ ^2-3)}{3+4\ \ ^2}$ $\quad |\quad|^2 = (1+\ \ ^2)\bullet\frac{16(12\ \ ^2-3\ \ ^2\ ^2+9)}{(3+4\ \ ^2)^2}$.

$|\quad| = \sqrt{1+\ \ ^2}\cdot\frac{4\sqrt{9\ \ ^2+9}}{3+4\ \ ^2} = \frac{12(1+\ \ ^2)}{3+4\ \ ^2}$.

$|\quad|^2 = 4|\quad|\quad = 0$ $\quad \Delta = 64\ \ ^4\ ^2 - 16(3+4\ \ ^2)(\ \ ^2\ ^2-3) > 0$

$: \ = -$

$\left(\frac{1}{2}\ -\frac{1}{2}\ \right)$ $\quad = \frac{1}{2}$. …………………………12

21. (本小题满分 12 分)

$(\ \ )\ (\ \ )$ $(0,+\infty)$. $(\ \ ) = \ '(\ \ ) = 2\ -\ \ln\ -$ $\quad '(\ \ ) = 2 - - = \frac{2\ -}{\ }$.

≤ 0 $\quad '(\ \ ) > 0$ $\quad = (\ \ )\ (0\ +\infty)$ $\quad = (\ \ )$.

> 0 $\quad '(\ \ ) = 0$ $\quad = \frac{}{2}$ $\quad = (\ \ )\ \left(0\ \frac{}{2}\right)$ $\quad \left(\frac{}{2}\ +\infty\right)$

.

$= (\ \ )$ $\quad \left(\frac{}{2}\right) = -\ \ln\frac{}{2}$. …………………………6

( )

(解法一) $(\ \ ) > 0\quad \forall\ \in [1\quad]$ $\quad (\ \ )_{min} > 0$.

≤ 2 $\quad (\quad)$ $\quad '(\ \ ) = \frac{2\ -}{\ } \ge 0$ $\quad (\ \ )\quad [1\quad]$

$(\ \ ) \ge\ (1) = 2 -\ \ge 0$.

(

$(\ )\quad [1\quad]\qquad (\ )_{\min} = (\ ) = {}^{2} - \quad + \quad +1 > 0$

$< \dfrac{^{2}+1}{-1}\qquad \geq 2\qquad .$

$-2 < \quad < \dfrac{^{2}+1}{-1}$. ……………………………12

（解法二） $\forall \ \in [1\quad]\quad (\ ) > 0\qquad \forall \ \in [1\quad]\quad {}^{2} - \quad \ln \quad + \quad +1 > 0$

$\forall \ \in [1\quad]\quad - \ \ln \quad + \dfrac{+1}{} > 0$.

$(\ ) = \ - \ \ln \quad + \dfrac{+1}{}\qquad '(\ ) = 1 - - - \dfrac{+1}{^{2}} = \dfrac{^{2} - \quad - (\ +1)}{^{2}} = \dfrac{(\ +1)(\ - \ -1)}{^{2}}$.

$+1 \leq 1\qquad \leq 0\qquad \forall \ \in [1\quad]\quad '(\ ) \geq 0\qquad (\ )\quad [1\quad]$

$(\ )_{\min} = (1) = 2 + \quad > 0\qquad > -2\qquad -2 < \quad \leq 0$.

$+1 \geq \qquad \geq \ -1\qquad \forall \ \in [1\quad]\quad '(\ ) \leq 0\qquad (\ )\quad [1\quad]$

$(\ )_{\min} = (\ ) = \ - \ + \dfrac{+1}{} > 0\qquad < \dfrac{^{2}+1}{-1}\qquad -1 \leq \quad < \dfrac{^{2}+1}{-1}$.

$1 < \quad +1 < \qquad 0 < \quad < \ -1\qquad \in [1\quad +1)\quad '(\ ) < 0\qquad \in [\ +1\quad]$

$'(\ ) > 0$

$(\ )\quad [1\quad +1]\qquad [\ +1,\ ]$

$(\ )\qquad (\qquad)$

23. (本小题满分 10 分)

$$(\quad)\quad(\quad)=3|\quad-1|+|\quad+1|=\begin{cases}-4\quad+2 & \le -1\\ -2\quad+4 & -1< \quad <1\\ 4\quad-2 & \ge 1\end{cases}$$

$=1$ $(\ )$ $=2$. ……………………………5

$(\quad)$ $^2+4\ ^2=2$.

$$\frac{1}{\ ^2}+\frac{1}{\ ^2+1}=\frac{1}{\ ^2}+\frac{4}{4\ ^2+4}=\left(\frac{1}{\ ^2}+\frac{4}{4\ ^2+4}\right)\left(\ ^2+4\ ^2+4\right)\cdot\frac{1}{6}$$

$$=\frac{1}{6}\left[1+\frac{4\ ^2+4}{\ ^2}+\frac{4\ ^2}{4\ ^2+4}+4\right]\ge\frac{1}{6}\left(5+2\sqrt{4}\right)=\frac{3}{2}\ .$$

$\frac{4\ ^2+4}{\ ^2}=\frac{4\ ^2}{4\ ^2+4}$ $^2=2$ $=0$.

……………………………10