2019-2020

20200708

12 5 60 1 10 11 12

1. $a//$ α $b\subset$ α

A $a//b$　　B a b　　C a b　　D a b

2. 10 40 .

0	9	8
1	1 3 4 8 9	3 2
2	0 1 1 3	7 6 5 4 2 0
3		7

A 29　　B

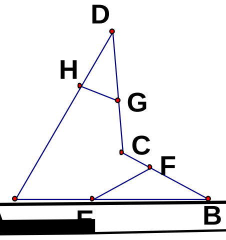
C 24　　D 21

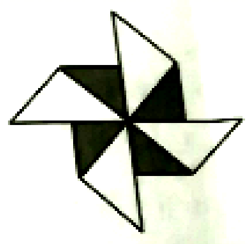
3. , $ABCD$ AB,BC,CD,DA E,F,G,H .

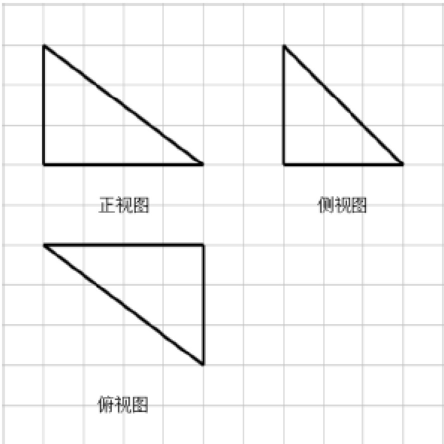
EF,GH P ,

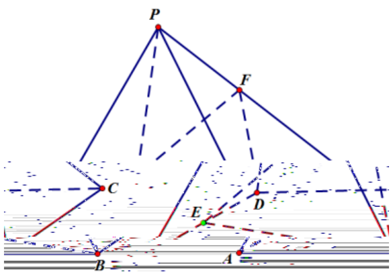
A P AC　　B P BD

C P DBC　　D









21

9. $\vec{a},\vec{b}$ 120° $|\vec{a}-\vec{c}|=1$ $|\vec{b}-\vec{c}|$

A　2　　B　$\sqrt{3}$　　C　$\sqrt{3}+1$　　D　$\sqrt{3}-1$

10. $f(x)=\sin(\omega x+\varphi)(\omega>0)$ $x=-\frac{\pi}{3}$ $f(x)$ $\left(\frac{\pi}{12},\frac{\pi}{6}\right)$

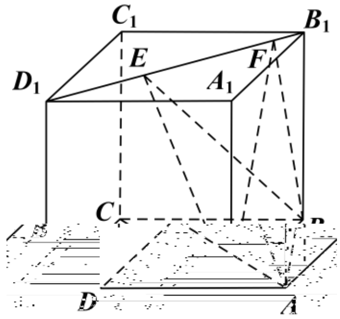
ω

A. 5　　B . 6　　C. 10　　D. 12

11. $z=\frac{2}{-1+\mathrm{i}}$

A　$|z|=2$　　B　$z^2=2\mathrm{i}$

C　z　$1+\mathrm{i}$　　D　z　-1



12. $ABCD-A_1B_1C_1D_1$ 1 B_1D_1

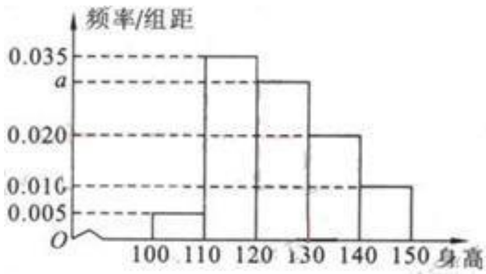
$EF=\frac{1}{2}$

A　$AC\perp BE$　　B　$EF//$　$ABCD$

C　ΔAEF　ΔBEF　　D　$A-BEF$

4　5　20　2　3 .

13. 100



. $a=$______

$[120,130),[130,140),[140,150]$

18　$[140,150]$

________.

14. $\vec{a}=(1,2),\vec{b}=(\cos\alpha,\sin\alpha)$ $\vec{a}//\vec{b}$ $\tan(\alpha+\frac{\pi}{4})=$_____ $\sin2\alpha=$______.

15. ΔABC $AB>AC$ $BC=2\sqrt{3}$ $A=60^\circ$ ΔABC $2\sqrt{3}$

$\sin B=$__________　AM　__________

16.

1 .

. 2 48

1


图 1

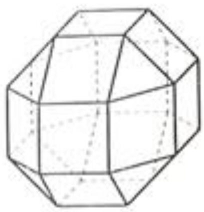


图 2

__________　____________

6 70 17 10

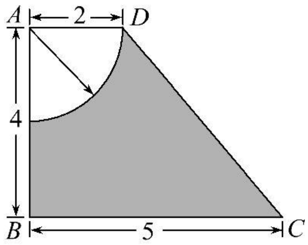
12

17. 10 (:cm), $ABCD$, AB .

.

V $\frac{1}{3}(s'+\sqrt{ss'}+s)h(s'$ s h)

S $=\pi(r'+r)l(r'$ r l)



18. 12 $f\left(x\right)=\sin x+a\cos x$（$x\in\mathbf{R}$） $\frac{\pi}{4}$ $f\left(x\right)$.

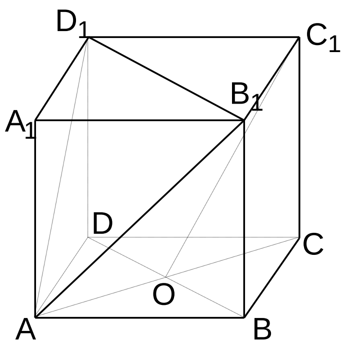
a $f\left(x\right)$

α ,$\beta\in\left(0,\frac{\pi}{2}\right)$ $f\left(\alpha+\frac{\pi}{4}\right)=\frac{\sqrt{10}}{5}$ $f\left(\beta+\frac{3\pi}{4}\right)=\frac{3\sqrt{5}}{5}$ $\sin\left(\alpha+\beta\right)$.

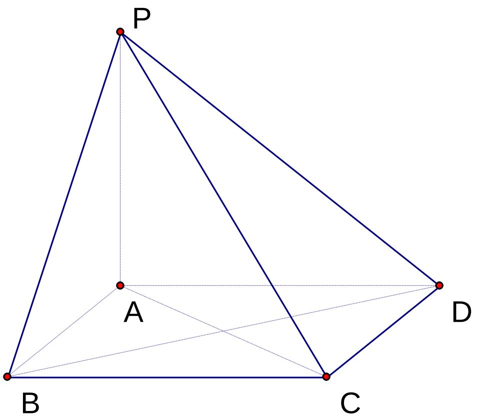
19. 12 $ABCD-A_1B_1C_1D_1$ a O $ABCD$.

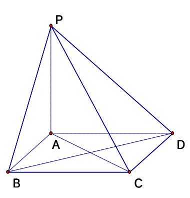
OC_1 AB_1D_1

OC_1 B_1D_1 .



20.   12





2019-2020

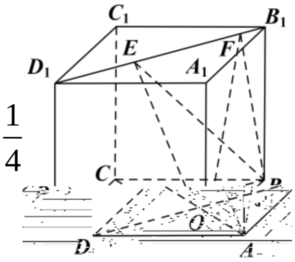
12 5 60 1 10 11 12

DCABA BCDCD BD ABD

10. $f\left(x\right)$ $\left(\frac{\pi}{12},\frac{\pi}{6}\right)$ $\frac{\pi}{6}-\frac{\pi}{12}=\frac{\pi}{12}\le\frac{T}{2}$ $T\ge\frac{\pi}{6}$ $\omega\le 12$

$\omega=12$ $f\left(x\right)$ $x=\frac{k\pi}{12}+\frac{\pi}{12}(k\in\mathbf{Z})$ $x=-\frac{\pi}{3}$.

12. $AC\perp$ D_1DBB_1 $AC\perp BE$ A



$B_1D_1//$ $ABCD$ $EF//$ $ABCD$ B

BD AC O AO $A-BEF$ $S_{\triangle BEF}=\frac{1}{2}\times\frac{1}{2}\times 1=\frac{1}{4}$

$A-BEF$ $\frac{1}{3}\times\frac{1}{4}\times\frac{\sqrt{2}}{2}=\frac{\sqrt{2}}{24}$ D

A B EF C .

4 5 20 2 3 .

13. 0.030 3 14. -3 $\frac{4}{5}$ 15. $\frac{1}{2}$ $\frac{4\sqrt{3}}{3}$ 16. 26 $\sqrt{2}-1$.

15. $S_{\triangle ABC}=\frac{1}{2}bc\sin A=\frac{1}{2}bc\sin 60°=2\sqrt{3}$, $bc=8$

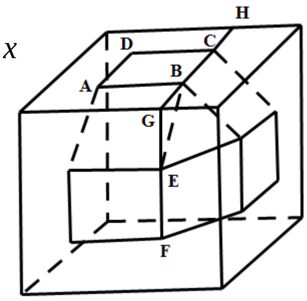
$a^2=b^2+c^2-2bc\cos A$ $b^2+c^2-bc=12$

$\begin{cases}c>b,\\ bc=8,\\ b^2+c^2-bc=12,\end{cases}$ $\begin{cases}b=2,\\ c=4,\end{cases}$ $\sin B=\frac{b\sin A}{a}=\frac{1}{2}$

$BC>AC$ $B=30^\circ, C=90^\circ$ $Rt\triangle ACM$ $AM=\frac{AC}{\cos 30^\circ}=\frac{4\sqrt{3}}{3}$

16. 9 18 8

$18+8=26$ x



$AB=BE=x$ BC FE G BC H

ΔBGE

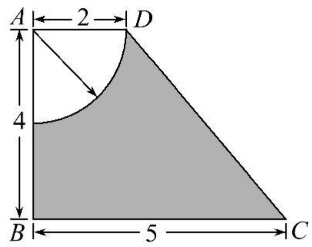
$\therefore BG=GE=CH=\frac{\sqrt{2}}{2}x,\quad \therefore\quad GH=2\times\frac{\sqrt{2}}{2}x+x=(\sqrt{2}+1)x=1$

$x=\sqrt{2}-1$ $\sqrt{2}-1$

6 70 17 10

12

17. AB .



V V_1 V_2

$V_1=\frac{1}{3}\pi(r^2+rr'+r'^2)h$

$=\frac{\pi}{3}\times(2^2+2\times 5+5^2)\times 4=52\pi$ ------------------2

$V_2=\frac{1}{2}\times\frac{4}{3}\pi r^3=\frac{1}{2}\times\frac{4\pi}{3}\times 2^3=\frac{16}{3}\pi$ ————————————4

1 2 $52\pi-\frac{16}{3}\pi=\frac{140}{3}\pi$ (cm³)

$\frac{140}{3}\pi$ cm³. ———————————————————5

S S_1,S_2 S_3

$l=\sqrt{4^2+(2-5)^2}=5$ ———————————————————6

$S_1=\pi\times(2+5)\times5=35\pi$ $S_2=\pi\times5^2=25\pi$ $S_3=\frac{1}{2}\times4\pi\times2^2=8\pi$ ——————————9

$S=S_1+S_2+S_3=68\pi$ ———————————————————10

18. $\frac{\pi}{4}$ $f(x)$ $f\left(\frac{\pi}{4}\right)=\sin\frac{\pi}{4}+a\cos\frac{\pi}{4}=0$ $a=-1$ ——————2

$f(x)=\sin x-\cos x=\sqrt{2}\left(\frac{\sqrt{2}}{2}\sin x-\frac{\sqrt{2}}{2}\cos x\right)=\sqrt{2}\sin\left(x-\frac{\pi}{4}\right)$ ————4

$2k\pi-\frac{\pi}{2}\le x-\frac{\pi}{4}\le 2k\pi+\frac{\pi}{2}$ $k\in Z$ $2k\pi-\frac{\pi}{4}\le x\le 2k\pi+\frac{3\pi}{4}$ $k\in Z$ ——————5

$f(x)$ $\left[2k\pi-\frac{\pi}{4},2k\pi+\frac{3\pi}{4}\right](k\in Z)$ ——————————6

$f\left(\alpha+\frac{\pi}{4}\right)=\frac{\sqrt{10}}{5}$ $\sqrt{2}\sin\alpha=\frac{\sqrt{10}}{5}$ $\sin\alpha=\frac{\sqrt{5}}{5}$. ——————————7

$\alpha\in\left(0,\frac{\pi}{2}\right)$ $\cos\alpha=\sqrt{1-\sin^2\alpha}=\frac{2\sqrt{5}}{5}$. ——————————————8

$f\left(\beta+\frac{3\pi}{4}\right)=\frac{3\sqrt{5}}{5}$ $\sqrt{2}\sin\left(\beta+\frac{\pi}{2}\right)=\frac{3\sqrt{5}}{5}$ $\cos\beta=\frac{3\sqrt{10}}{10}$ ——————9

$\beta\in\left(0,\frac{\pi}{2}\right)$ $\sin\beta=\sqrt{1-\cos^2\beta}=\frac{\sqrt{10}}{10}$ ———————————————10

$\sin(\alpha+\beta)=\sin\alpha\cos\beta+\cos\alpha\sin\beta$ ————————————————11

$=\frac{\sqrt{5}}{5}\times\frac{3\sqrt{10}}{10}+\frac{2\sqrt{5}}{5}\times\frac{\sqrt{10}}{10}=\frac{\sqrt{2}}{2}$ ——————————————12

19. A_1C_1 B_1D_1 O_1 AO_1

$AA_1//CC_1$ $AA_1=CC_1$ AA_1C_1C

$A_1C_1//AC$ A_1C_1 AC ——————————————2

O_1 O A_1C_1 AC

$O_1C_1//AO$ $O_1C_1=AO$ AOC_1O_1

$OC_1//AO_1$ ——————————————4

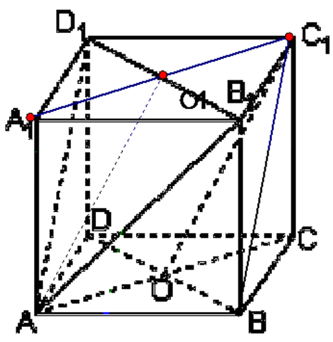
$OC_1\not\subset$ AB_1D_1, $AO_1\subset$ AB_1D_1

OC_1 AB_1D_1 ——————————————6

$BB_1//DD_1$ $BB_1=DD_1$ BB_1D_1D

BD B_1D_1 ——————————————8

$\angle C_1OB$ OC_1 B_1D_1 ——————9



BC_1 OBC_1 $OB=\dfrac{\sqrt{2}}{2}a, BC_1=\sqrt{2}a, OC_1=\dfrac{\sqrt{6}}{2}a$

$OC_1^{\ 2}+OB^2=BC_1^{\ 2}$

$\angle C_1OB=90^\circ$ OC_1 B_1D_1 90° --------12

20. $\because \overline{x}=\dfrac{8+10+12+14}{4}=11$ $\overline{y}=\dfrac{16+19+23+26}{4}=21$ ------------------------2

$\sum_{i=1}^{4}(x_i-\overline{x})(y_i-\overline{y})=(-3)\times(-5)+(-1)\times(-2)+1\times2+3\times5=34$

$\sum_{i=1}^{4}(x_i-\overline{x})^2=(-3)^2+(-1)^2+1^2+3^2=20$ ------------------------4

$\therefore b=\dfrac{\sum_{i=1}^{4}(x_i-\overline{x})(y_i-\overline{y})}{\sum_{i=1}^{4}(x_i-\overline{x})^2}=\dfrac{34}{20}=1.7$ ------------------------5

$\therefore a=\overline{y}-b\overline{x}=21-1.7\times11=2.3$ ------------------------6

$\therefore y=1.7x+2.3$

$\because y=1.7x+2.3$

$x=16$ $y=1.7\times16+2.3=29.5$

$x=18$ $y=1.7\times18+2.3=32.9$ ------------------------8

$|29.5-29|=0.5<1$ $|32.9-33|=0.1<1$

$y=1.7x+2.3$ ------------------------10

$1.7x+2.3\le38$ $x\le21$

$\therefore$ 21 ------------------------12

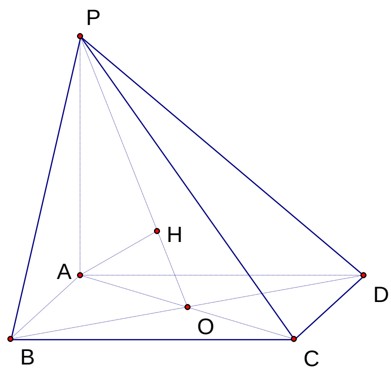
21. $PA\perp$ $ABCD$ $CD\subset$ $ABCD$ $PA\perp CD$ -----------------1

$ABCD$ $AD\perp CD$ --------------------------2

$PA\cap AD=A$ $PA, AD\subset$ PAD

$CD\perp$ PAD ------------------------------4

A PBD d 1



$V_{P-ABD}=\dfrac{1}{6}\times1^3=V_{A-PBD}=\dfrac{1}{3}d\cdot S_{\Delta PBD}$ ---------------6

ΔPBD $\sqrt{2}$

$S_{\Delta PBD}=\dfrac{\sqrt{3}}{4}\cdot(\sqrt{2})^2=\dfrac{\sqrt{3}}{2}$ ---------------7

$d=\dfrac{\sqrt{3}}{3}$ --8

PA PBD α

$\sin\alpha=\dfrac{d}{PA}=\dfrac{\sqrt{3}}{3}$

PA PBD $\dfrac{\sqrt{3}}{3}$ ---------------12

$PBD\perp$ PAC --------------------------------------9

$PBD \cap \quad PAC = PO$

$A \quad AH \perp PO \quad\quad H$

$PBD \perp \quad PAC \quad\quad PBD \cap \quad PAC = PO \quad\quad AH \perp \quad PBD$

$\angle APH \quad\quad PA \quad\quad PBD$ ------------------11

$Rt\Delta PAO \quad\quad PA = 1 \quad AO = \frac{\sqrt{2}}{2} \quad\quad \angle PAO = 90^\circ$

$PO = \frac{\sqrt{6}}{2} \quad\quad \sin\angle APH = \frac{AO}{PO} = \frac{\sqrt{3}}{3}$

$PA \quad\quad PBD \quad\quad \frac{\sqrt{3}}{3}$ ---------------12

22. $\because b + c = 2a\cos B$

$\sin B + \sin C = 2\sin A\cos B$ -------------------------1

$\therefore \sin B + \sin(A+B) = 2\sin A\cos B \quad \therefore \sin B = \sin(A-B)$

$\because A \quad B \quad C \quad\quad \therefore A = 2B$ -------------------------3

$\sin C + \tan B\cos C = 1 \quad\quad \sin(B+C) = \cos B$ -----------------------4

$\therefore \sin A = \cos B > 0 \quad \therefore \sin B = \frac{1}{2}$

$B \in (0, \pi) \therefore B = \frac{\pi}{6} \quad A = \frac{\pi}{3}$.