一

$C: y^2 \quad 2px \quad p \quad 0$ F l $\sqrt{3}$上 F l C A

B A D $|AF| \quad 4$

$p \quad 2$ F AD $|BD| \quad 2|BF|$ $|BF| \quad 2$

$ABCD \quad A_1B_1C_1D_1$ $AB \quad 4$ BB_1, CD

P BC_1一

A_1F AD_1E

AD_1E $ABCD \quad A_1B_1C_1D_1$ 18

$P \quad AD_1E$ P

AE $ABCD \quad A_1B_1C_1D_1$ 5

a_n

公

a,b,c $\mathbf{R}$ $f(x)$ $(x$ $a)(x$ $b)(x$ $c)$ $f'(x)$

b c y $f(x)$ $(b, f(b))$ 函

$\frac{1}{f'(a)}$ $\frac{1}{f'(b)}$ $\frac{1}{f'(c)}$

a_n b_n a_n $b_{n\ 1}$ $a_{n\ 1}$ b_n $2a_n$ $a_{n\ 1}$ 0 上 a_1 1 b_1 1

c_n $\frac{b_n}{a_n}$

c_n

a_n 上 a_2 3 b_n n S_n

围 ABE $ABCD$ AB 2 ABC 60°

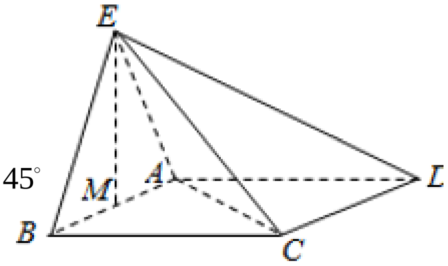
M AB

EM AD

A BE C

EC 一 P AP ABE 45°

$\frac{EP}{EC}$ 七



$\{a_n\}$ a_1 $\frac{1}{2}$ $a_{n\ 1}$ 1 a_n 1 $2a_n$ 1 n $\mathbf{N}^*$

$\{a_n\}$

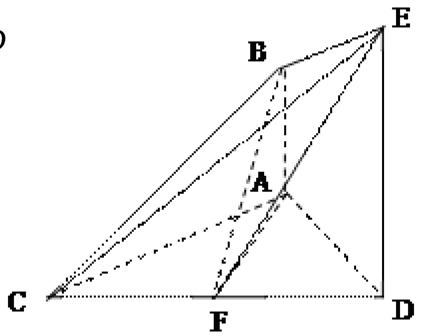
n $\mathbf{N}^*$ $a_1a_2a_3$ $a_2a_3a_4$ $\cdots$ $a_na_{n\ 1}a_{n\ 2}$ $\frac{1}{12}$

围 AB ACD DE ACD

AB 2 AC AD DE 4 F CD

$AF \parallel$ BCE

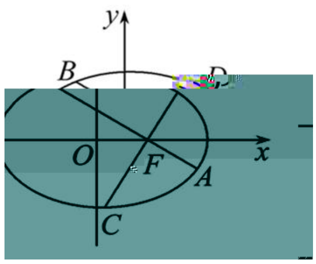
CAD 60° F BE D



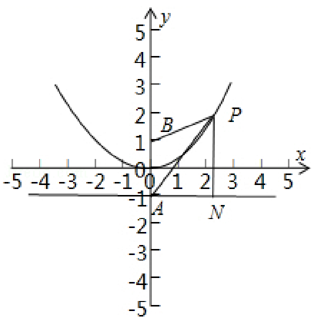
围 $C:\frac{x^2}{a^2}$ $\frac{y^2}{b^2}$ 1 a b 0 $\frac{1}{2}$ F

AB CD AB 0

$|AB|$ $|CD|$双 AB



一



公

$b \quad c \qquad f(x) \quad (x \quad a)(x \quad b)^2 \qquad f'(x) \quad (x \quad b)^2 \quad (x \quad a) \ 2(x \quad b)$

$f'(b) \quad (b \quad b)^2 \quad (x \quad a) \ 2(b \quad b) \quad 0 \qquad y \quad f(x) \qquad (b, f(b))$ 函 $\qquad 0$

$f(b) \quad (b \quad a)(b \quad b)^2 \quad 0$ 函 $\qquad y \quad 0$

$f(x) \quad (x \quad a)(x \quad b)(x \quad c)$

$f'(x) \quad (x \quad b)(x \quad c) \quad (x \quad a)\ (x \quad b)(x \quad c) \quad (x \quad b)(x \quad c) \quad (x \quad a)(x \quad c) \quad (x \quad a)(x \quad b)$

$f'(b) \quad (b \quad a)(b \quad c) \qquad f'(c) \quad (c \quad a)(c \quad b)$

$$\frac{1}{f'(a)} \quad \frac{1}{f'(b)} \quad \frac{1}{f'(c)} \quad \frac{1}{(a \quad b)(a \quad c)} \quad \frac{1}{(b \quad a)(b \quad c)} \quad \frac{1}{(c \quad a)(c \quad b)}$$

$$\frac{1}{a \quad b} \quad \frac{1}{a \quad c} \quad \frac{1}{b \quad c} \quad \frac{1}{(c \quad a)(c \quad b)} \quad \frac{1}{a \quad b} \ \frac{b \quad a}{(a \quad c)(b \quad c)} \quad \frac{1}{(a \quad c)(b \quad c)}$$

$$\frac{1}{(a \quad c)(b \quad c)} \quad \frac{1}{(a \quad c)(b \quad c)} \quad 0$$

$a_n \ b_{n\ 1} \quad a_{n\ 1}\ b_n \quad 2a_n \ a_{n\ 1} \quad 0 \qquad a_n \ b_{n\ 1} \quad a_{n\ 1}\ b_n \quad 2a_n \ a_{n\ 1}$

$\frac{1}{a_n \ a_{n\ 1}} \qquad \frac{b_{n\ 1}}{a_{n\ 1}} \ \frac{b_n}{a_n} \quad 2 \qquad c_{n\ 1} \quad c_n \quad 2 \qquad c_1 \ \frac{b_1}{a_1} \quad 1$

$c_n \qquad 1 \qquad 2$

$c_n \quad 1 \quad 2 \ n \quad 1 \quad 2n \quad 1 \quad n \quad \mathbf{N}$

$a_n \qquad q \qquad q \ \frac{a_2}{a_1} \ \frac{3}{1} \quad 3 \qquad a_n \quad 1\ 3^{n\ 1} \quad 3^{n\ 1} \quad n \quad \mathbf{N}$

$c_n \quad 2n \quad 1$ 上 $c_n \ \frac{b_n}{a_n} \qquad b_n \quad c_n \ a_n \quad 2n \quad 1 \quad 3^{n\ 1}$

$S_n \quad 1 \ 3^0 \quad 3 \ 3^1 \qquad 2n \quad 1 \quad 3^{n\ 1}$

$3S_n \quad 1 \ 3^1 \quad 3 \ 3^2 \qquad 2n \quad 1 \quad 3^n$

$2S_n \quad 1 \quad 2 \ 3^1 \quad 2 \ 3^2 \quad 2 \ 3^3 \qquad 2 \quad 3^{n\ 1} \quad 2n \quad 1\ 3^n$

$$1 \quad \frac{2 \ 3 \quad 2 \ 3^{n\ 1} \quad 3}{1 \quad 3} \quad 2n \quad 1 \quad 3^n \quad 2 \quad 2n \quad 2 \quad 3^n$$

$S_n \quad n \quad 1 \quad 3^n \quad 1$

$\because EA \quad EB \quad M \quad AB \qquad EM \quad AB$

$\because \quad ABE \qquad ABCD \qquad ABE \cap \quad ABCD \quad AB \quad EA \qquad ABE$

$EM \qquad ABCD$

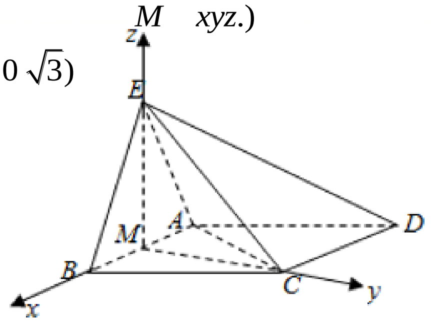
$AD \qquad ABCD \qquad EM \quad AD.$

$\because EM \qquad ABCD \qquad EM \quad MC \quad \because \triangle ABC$

$MC \quad AB. \quad MB, MC, ME$ 围 $\qquad M \quad xyz.)$

$M(0,0\ 0) \quad A(\ \ 1,0\ 0) \quad B(1,0\ 0) \quad C(0,\sqrt{3},0) \quad E(0,0\ \sqrt{3})$

$\overrightarrow{BC} \quad 1,\sqrt{3},0 \quad \overrightarrow{BE} \quad (\ \ 1,0,\sqrt{3})$



$\vec{m} \quad (x, y, z) \qquad BCE$

$\vec{m}\ \overrightarrow{BC}\quad x\quad \sqrt{3}y\quad 0$

$\vec{m}\ \overrightarrow{BE}\quad x\quad \sqrt{3}z\quad 0$ $\quad z\quad 1\quad \vec{m}\quad \sqrt{3},1,1$

$\because y\quad ABE\quad \vec{n}\quad (0,1,0)\quad ABE$

$\cos\langle\vec{m},\vec{n}\rangle\quad \frac{\vec{m}\ \ \vec{n}}{|\vec{m}||\vec{n}|}\quad \frac{1}{\sqrt{5}\ \ 1}\quad \frac{\sqrt{5}}{5}\qquad A\quad BE\quad C\qquad \frac{\sqrt{5}}{5}.$

CE 一 $\quad P\quad PA\quad ABE\quad 45^\circ$

$\overrightarrow{AE}\quad (1,0,\sqrt{3})\quad \overrightarrow{EC}\quad 0,\sqrt{3},\ \ \sqrt{3}\qquad \overrightarrow{EP}\quad \overrightarrow{EC}\quad 0\sqrt{3}\ ,\ \sqrt{3}\qquad 0\qquad 1$

$\overrightarrow{AP}\quad \overrightarrow{AE}\quad \overrightarrow{EP}\quad 1,\sqrt{3}\ ,\sqrt{3}\quad \sqrt{3}$

$\because\quad PA\quad ABE\quad 45^\circ$

$\sin 45^\circ\quad \left|cos\langle\overrightarrow{AP},\vec{n}\rangle\right|\quad \frac{|\overrightarrow{AP}\ \ \vec{n}|}{|\overrightarrow{AP}||\vec{n}|}\quad \frac{|\sqrt{3}\quad|}{\sqrt{1\quad 3\ ^2\quad 3\ \ 6\quad 3\ ^2\quad 1}}\quad \frac{\sqrt{2}}{2}$

$0\qquad 1\qquad \frac{2}{3}$

EC 一 $\quad P\quad PA\quad ABE\quad 45^\circ$ 上 $\frac{EP}{EC}\quad \frac{2}{3}.$

$a_{n\ 1}\quad 1\quad a_n\quad 1\quad 2a_n\quad 1\qquad a_{n\ 1}\quad \frac{a_n}{1\quad a_n}$

$a_1\quad \frac{1}{2}\quad 0\qquad a_2\quad \frac{a_1}{1\quad a_1}\quad 0\qquad a_n\quad 0$

$\frac{1}{a_{n\ 1}}\quad \frac{1\quad a_n}{a_n}\quad \frac{1}{a_n}\quad 1\qquad \frac{1}{a_{n+1}}-\frac{1}{a_n}=1$

$\frac{1}{a_n}\qquad 2\qquad 1\qquad \frac{1}{a_n}\quad n\quad 1\qquad a_n\quad \frac{1}{n\quad 1}$

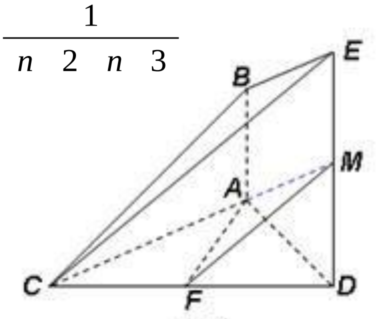
$a_n\quad \frac{1}{n\quad 1}\qquad k\quad 1,2,3,\cdots$

$a_k a_{k\ 1} a_{k\ 2}\quad \frac{1}{k\quad 1\quad k\quad 2\quad k\quad 3}\quad \frac{1}{2}\ \frac{1}{k\quad 1\quad k\quad 2}\quad \frac{1}{k\quad 2\quad k\quad 3}$

$a_1a_2a_3\quad a_2a_3a_4\quad \cdots\quad a_na_{n\ 1}a_{n\ 2}$

$\frac{1}{2}\quad \frac{1}{2\quad 3}\quad \frac{1}{3\quad 4}\qquad \frac{1}{3\quad 4}\quad \frac{1}{4\quad 5}\qquad \cdots\qquad \frac{1}{n\quad 1\quad n\quad 2}\quad \frac{1}{n\quad 2\quad n\quad 3}$

$\frac{1}{2}\ \frac{1}{2\quad 3}\quad \frac{1}{n\quad 2\quad n\quad 3}\qquad \frac{1}{12}$



图(1)

围 双 $DE\qquad M$

$\because AB\quad ACD\quad DE\quad ACD\quad AB//DE$

$\because AB\quad EM\quad \frac{1}{2}DE\qquad ABEM\qquad AM\ //\ BE$

$AM\quad BCE\quad BE\quad BCE\quad AM\ ||\quad BCE$

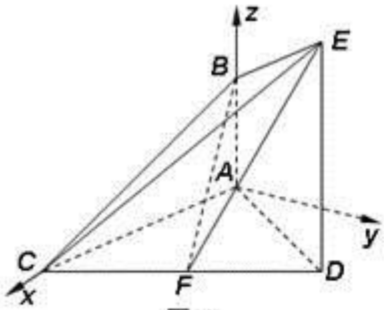
$CF\quad FD\quad DM\quad ME\quad ME\,||\,CE\quad MF\quad BCE\quad CE\quad BCE$

$MF\ ||\quad BCE\quad AM\quad MF\quad M\ ''\quad AMF\ ||\quad BCE$

AF AMF $AF \parallel$ BCE

A x z A xyz 围

A $0,0,0$ B $0,0,2$ $F(3,\sqrt{3},0)$



图(4)

$\overrightarrow{AB}$ $(0,0,2)$ $\overrightarrow{BE}$ $(2,2\sqrt{3},2)$

BEF $\overrightarrow{n_1}$ (x_1,y_1,z_1)

$2x_1$ $2\sqrt{3}y_1$ $2z_1$ 0

$3x_1$ $\sqrt{3}y_1$ $2z_1$ 0

双 y_1 $\sqrt{3}$ $\overrightarrow{n_1}$ $(\frac{9}{5},\sqrt{3},\frac{6}{5})$

$ABED$ $\overrightarrow{n_2}$ (x_2,y_2,z_2)

$2z_2$ 0

$2x_2$ $2\sqrt{3}y_2$ $2z_2$ 0 双 y_2 $\sqrt{3}$ $\overrightarrow{n_2}$ $(3,\sqrt{3},0)$

$\cos \overrightarrow{n_1},\overrightarrow{n_2}$ $\frac{7}{8}$ F BE D $\frac{7}{8}$

$-\frac{1}{}$ $2a$ 4 a^2 b^2 c^2 a 2 b $\sqrt{3}$

$\frac{x^2}{4}$ $\frac{y^2}{3}$ 1

0 七

$|AB|$ $|CD|$ 7 七

上七 0 AB y $k(x$ $1)$

CD y $\frac{1}{k}(x$ $1)$ $A(x_1,y_1)$ $B(x_2,y_2)$

导 AB 3 $4k^2$ x^2 $8k^2x$ $4k^2$ 12 0

x_1 x_2 $\frac{8k^2}{3 \quad 4k^2}$ x_1x_2 $\frac{4k^2 \quad 12}{3 \quad 4k^2}$

$|AB|$ $\sqrt{k^2 \quad 1}|x_1 \quad x_2|$ $\sqrt{k^2 \quad 1}$ $\sqrt{(x_1 \quad x_2)^2\text{-}4x_1x_2}$ $\frac{12(k^2 \quad 1)}{3 \quad 4k^2}$

$|CD|$ $\frac{12\ \frac{1}{k^2} \quad 1}{3 \quad \frac{4}{k^2}}$ $\frac{12(k^2 \quad 1)}{3k^2 \quad 4}$

$|AB|$ $|CD|$ $\frac{12(k^2 \quad 1)}{3 \quad 4k^2}$ $\frac{12(k^2 \quad 1)}{3k^2 \quad 4}$ $\frac{84(k^2 \quad 1)^2}{(3 \quad 4k^2)(3k^2 \quad 4)}$

$\frac{84(k^2 \quad 1)^2}{\frac{3 \quad 4k^2 \quad 3k^2 \quad 4}{2}^2}$ $\frac{48}{7}$

上 3 $4k^2$ $3k^2$ 4 k 1 一 双

AB x y 1 0 x y 1 0