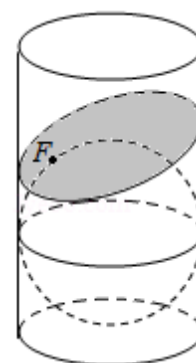


1. \bar{a} 1, 2, 3, \bar{b} $x^2 - 3x + 50$ $\bar{a} // \bar{b}$ x
 A 1 B 0 C 1 D 2
2. a_n a_3 a_7 10 a_6 7 d
 A 1 B 2 C 3 D 4
3. M 2 3 $x - 2y - 9 = 0$
 A $2x - y - 8 = 0$ B $x - 2y - 7 = 0$ C $x - 2y - 4 = 0$ D $x - 2y - 1 = 0$
4. a_n



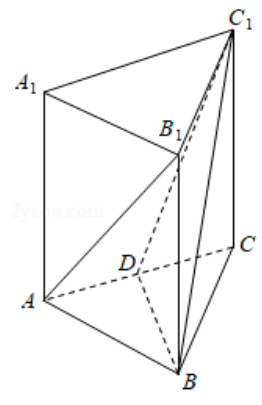
12. ABC A_1B_1C BC_1 AB_1 D AC E BCC_1B_1

A $\overline{DA} = \frac{1}{2} \overline{A_1A} + \overline{B_1A} + \overline{BC}$

B $DE \parallel$ ABB_1A_1 $E = \frac{\sqrt{2}}{2} AC$

C $AD = BC_1 = \frac{\sqrt{6}}{6}$

D $E = ACC_1A_1 = \frac{\sqrt{3}}{2} EB = E$



4 5 20 2 3 .

13. $x^2 - 4y = \underline{\hspace{2cm}}$

14. $S_n = \underline{\hspace{2cm}}$ $a_n = n$ $a_1 = a_2 = 3$ $a_3 = a_4 = 12$

$q = \underline{\hspace{2cm}}$ $S_6 = \underline{\hspace{2cm}}$

15. $C: x^2 + y^2 - 2x - 1 = 0$ C $l: 3x + y - 12 = 0$ $\underline{\hspace{2cm}}$

P l P C $\underline{\hspace{2cm}}$

16.

$A_k = x|x a_k = 2^k$ $a_{k-1} = 2^{k-1}$ $a_1 = 2^1$ $a_0 = 2^0$ $k \in \mathbf{N}$ $a_k = 1$ $a_0 = a_1 = a_{k-1} = 0 = 1$

$A_1 = 23$ $A_2 = 4567$ $A_4 = \underline{\hspace{2cm}}$

$f(x) = \frac{0}{1}x + \frac{a_0}{a_0}x + \frac{a_1}{a_1}x^2 + \frac{a_2}{a_2}x^3 + \frac{a_k}{a_k}x^k = 1 + x + x^2 + x^3 + \dots + x^k$ $x \in A_k$ $k = 5$

$x|f(x) = 1 + x + A_k$ $c_n = c_n$

6 70 12 17 10

17. $10 = a_n = a_1 + 2 + a_3 + a_1 + a_7$

$a_n = n$ $a_n = n$ $S_n = 27$

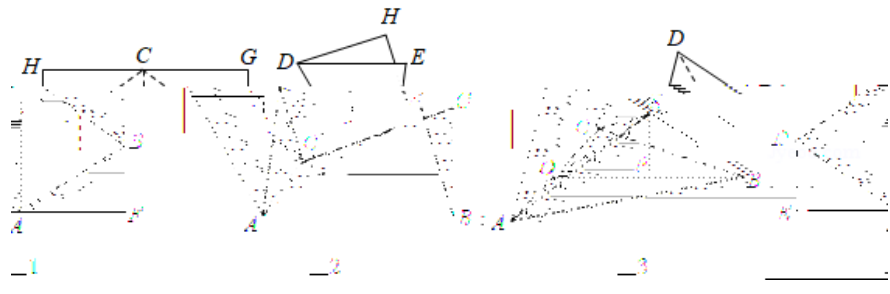
18. 12 C y^3 C $A(4,2), D(0,2)$
 C
 $P(1,1)$ l C 4 l

19. 12 O x C $\frac{3}{2}\sqrt{6}$
 C
 y x 4 C OA OB

20. 12 a_n $a_1 - 1$ na_{n-1} $n - 1$ $a_n - 1$
 b_n $\frac{a_n}{n}$ b_n
 $2^n a_n$ n S_n

21. 12 A4 $\sqrt{2}:1$
 A4 EFCH EF:EH $\sqrt{2}:1$
 1 A4 EFCH EF:EH $\sqrt{2}:1$
 A B C D EF FG GH HE AB BC CD DA AC 2
 E F G H S 3 D ABC O AC
 SOB SP BO
 SP// ACD
 M,N AB, BC AM BN B DMN DAB

DMN



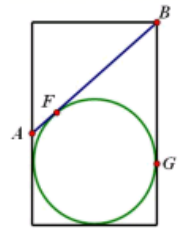
22. 12 PAB A B A(0, $\sqrt{3}$) B(0, $\sqrt{3}$) PA, PB
 $\frac{3}{2}$
 F_1, F_2 $|PF_1|$ $|PF_2|$
 P C, D, E AC, AD y AC AE
 DE

1-5. CBCDA 6-10. CCDDB

10.

0

$$a = \frac{5}{4}, \quad e = \frac{3}{5}, \quad c = \frac{3}{4}, \quad |BF| = 2, \quad |BG| = 1$$



$$2 \quad 5 \quad 10 .$$

5

$$0 \quad 3 .$$

11. AC 12. BCD

12.

$$\vec{AD} = \frac{1}{2} \vec{AA_1} + \vec{B_1A} + \vec{BC}$$

Coordinate system $Oxyz$ with origin at A .
 $A(a/2, 0, 0)$, $B(0, \frac{\sqrt{3}}{2}a, 0)$, $B_1(0, \frac{\sqrt{3}}{2}a, b)$, $C_1(a/2, 0, b)$

$$\vec{BC_1} = (\frac{a}{2}, \frac{\sqrt{3}}{2}a, b), \quad \vec{AB_1} = (\frac{a}{2}, \frac{\sqrt{3}}{2}a, b)$$

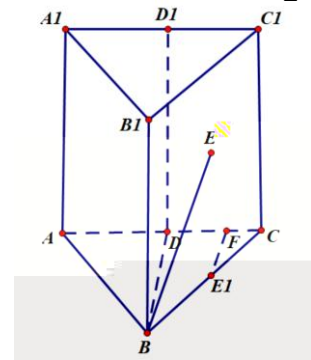
$$\vec{DA} = (\frac{a}{2}, 0, 0), \quad \vec{BC_1} \cdot \vec{AB_1} = 0$$

$$\frac{a^2}{2} + \frac{\sqrt{3}}{2}a^2 + b^2 = 0, \quad b = \frac{\sqrt{2}}{2}a$$

$$DE \parallel \text{plane } ABB_1A_1, \quad |BB_1| = \frac{\sqrt{2}}{2}|AC|$$

$$\vec{DA} = (\frac{a}{2}, 0, 0), \quad \vec{BC_1} = (\frac{a}{2}, -\frac{\sqrt{3}}{2}a, \frac{\sqrt{2}}{2}a)$$

$$\cos \angle(\vec{BC_1}, \vec{DA}) = \frac{|\vec{BC_1} \cdot \vec{DA}|}{|\vec{BC_1}| |\vec{DA}|} = \frac{\frac{a^2}{2}}{\frac{\sqrt{6}}{2}a \cdot \frac{a}{2}} = \frac{\sqrt{6}}{6}$$



$$E \in \text{plane } ACC_1A_1, \quad E_1F = \frac{\sqrt{3}}{2}EB$$

$$CE_1F, \quad E_1F = \frac{\sqrt{3}}{2}E_1C, \quad EB = E_1C, \quad E_1C = E_1C, \quad E \in CC_1$$

E, D

13. (0 1) y^4 14. $2 \cdot 63$ 15. $\sqrt{10}$ y^3 $3x$ $4y^3$ 0 16. 376 760
16. A_4 $n|n$ a_4 2^4 a_3 2^3 a_2 2^2 a_1 2^1 a_0 2^0
 a_4 1 a_0 a_1 a_2 a_3 0 n 16 a_0 a_1 a_2 a_3 a_4 1 n 31
 A_4 16 17 18 31 16 $\frac{16 \ 16 \ 31}{2}$ 376
 a_4 1 k 5 c_n 1
 a_3 1 a_2 1 a_1 1 a_0 1 8
16 2^5 8 2^4 2^3 2^2 2^4 2^0 760
6 70 17 10
17. 12
10
 a_n d a_3 a_1 a_7 a_3^2 a_1 a_7 1
 a_1 2 2 $2d^2$ 2 2 $6d$ d 1 4
 a_n n 1 5
 S_n $\frac{n \ 2 \ n \ 1}{2}$ $\frac{n \ n \ 3}{2}$ 7
 $\frac{n \ n \ 3}{2}$ 27 n^2 $3n$ 54 0 n 6 9
 n 6 S_n 27 10
18. 12
 C $a, 3$ C x a^2 y 3^2 r^2 1
 A 4,2 , B 0,2 C 4 a^2 2 3^2 r^2 a 2 5
 a^2 2 3^2 r^2 r $\sqrt{5}$
 C x 2^2 y 3^2 5 6
 C l d $\sqrt{5}$ 4 1 8
 l x 1 l 1 9
 l $l:y$ 1 k x 1 kx y k 1 0
 C l d $\frac{|2k \ 3 \ k \ 1|}{\sqrt{1 \ k^2}}$ 1 k $\frac{3}{4}$ 11
 l y 1 $\frac{3}{4}$ x 1 $3x$ $4y$ 1 0
 x 1 $3x$ $4y$ 1 0 12
19. 12
 y^2 $2px$, 2
 C $\frac{3}{2}\sqrt{6}$

$$\begin{array}{l}
 y^2 - 4x \quad x \quad y^2 - 4y - 16 = 0 \quad 7 \\
 y - x - 4 \\
 A(x_1, y_1), B(x_2, y_2) \quad y_1 y_2 = 16 \quad 8 \\
 y_1^2 - 4x_1 \quad x_1 x_2 \quad \frac{y_1^2 y_2^2}{16} = 16 \quad 10 \\
 y_2^2 - 4x_2 \\
 \overrightarrow{OA} \cdot \overrightarrow{OB} = x_1 x_2 + y_2 y_2 = 0 \quad OA \perp OB \quad 12 \\
 20. \quad 12
 \end{array}$$

$$na_{n-1} - (n-1)a_n = 1 \quad n(n-1) \frac{a_{n-1}}{n-1} - \frac{a_n}{n} = \frac{1}{n(n-1)} \quad 2$$

$$b_n = \frac{a_n}{n} \quad b_{n-1} = b_n \frac{1}{n(n-1)} \quad 3$$

$$b_2 = b_1 \frac{1}{1 \cdot 2} \quad b_3 = b_2 \frac{1}{2 \cdot 3} \quad b_4 = b_3 \frac{1}{3 \cdot 4} \quad b_n = b_{n-1} \frac{1}{n(n-1)}$$

$$b_n = b_1 \frac{1}{1 \cdot 2} \frac{1}{2 \cdot 3} \frac{1}{3 \cdot 4} \dots \frac{1}{n(n-1)}$$

$$1 \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{4} \cdot \frac{1}{4} \dots \frac{1}{n-1} \cdot \frac{1}{n} = 1 \cdot \frac{1}{n} \quad 5$$

$$b_1 = \frac{1}{a_1} = 1 \quad b_n = 2 \cdot \frac{1}{n} \quad 6$$

$$a_n = nb_n = 2n \cdot \frac{1}{n} = 2 \quad c_n = 2^n \quad a_n = 2n - 1 = 2^n \quad 7$$

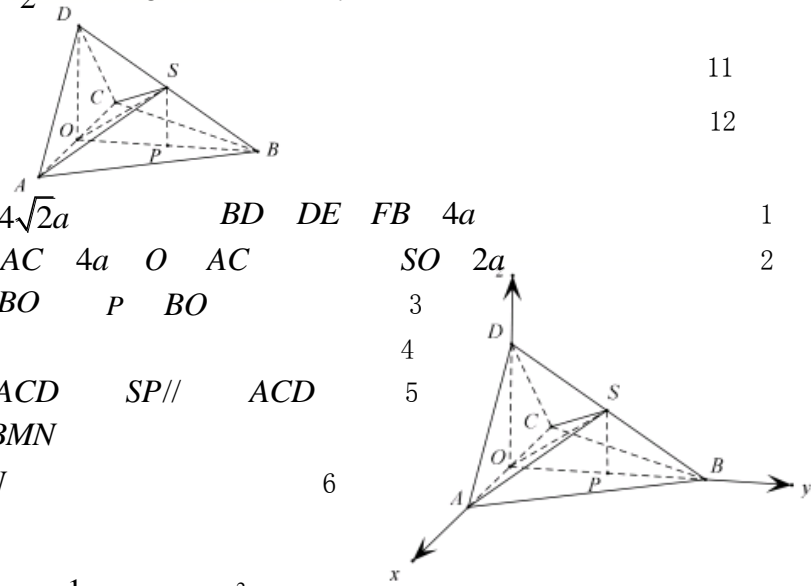
$$S_n = 1 + 2^1 + 3 + 2^2 + 5 + 2^3 + \dots + 2n - 3 + 2^{n-1} + 2n - 1 = 2^n \quad 8$$

$$2S_n = 1 + 2^2 + 3 + 2^3 + 5 + 2^4 + \dots + 2n - 3 + 2^n + 2n - 1 = 2^{n+1} \quad 9$$

$$S_n = 2 + 2 \frac{4 + 1 + 2^{n-1}}{1 + 2} = 2n - 1 + 2^{n-1} \quad 2 + 8 + 2^{n-1} + 1 = 2n - 1 + 2^{n-1} \quad 11$$

$$S_n = 2n - 3 + 2^{n-1} = 6 \quad 12$$

21. 12



$$\begin{array}{l}
 DO = EH = 4a \quad EF = 4\sqrt{2}a \quad BD = DE = FB = 4a \quad 1 \\
 SAC = SA = SC = 2\sqrt{2}a \quad AC = 4a \quad O = AC \quad SO = 2a \quad 2 \\
 SOB = BS = 2a, SP = BO = P = BO \quad 3 \\
 SP \parallel DO \quad 4 \\
 SP \perp ACD \quad DO \perp ACD \quad SP \parallel DO \perp ACD \quad 5 \\
 V_B - DMN = V_D - BMN \quad D = BMN \quad 6 \\
 S_{BMN} = B = DMN \\
 AM = BN = x \quad 0 \leq x \leq 2\sqrt{3}a \\
 S_{BMN} = \frac{1}{2} \sin \theta \cdot \frac{1}{2} (x - \sqrt{3}a)^2 = 3a^2 \sin \theta \quad MBN \\
 \sin \theta = \frac{MBN}{AB, BC} \quad x = \sqrt{3}a \quad S_{\triangle BMN} = B = DMN \quad 7
 \end{array}$$

	SP	DO	SP	BO	DO	BO																	
DA	DC	BA	BC	DO	AC	BO	AC						8										
O		$\overline{OA}, \overline{OB}, \overline{OD}$			x, y, z							Oxyz											
A	2a, 0, 0		B 0, 2√2a, 0		C 2a, 0, 0		D 0, 0, 2√2a		M a, √2a, 0		N a, √2a, 0												
\overline{DM}	a, √2a,	2√2a	\overline{NM}		2a, 0, 0		\overline{DA}		2a, 0, 2√2a		\overline{AB}		2a, 2√2a, 0										
\overline{DMN}			\vec{n}_1		x ₁ , y ₁ , z ₁		\vec{n}_1		\overline{DM}		0	ax ₁	√2ay ₁	2√2az ₁	0								
z ₁	1	y ₁	2	x ₁	0	\overline{DMN}		\vec{n}_1		0, 2, 1					10								
\overline{DAB}			\vec{n}_2		x ₂ , y ₂ , z ₂		\vec{n}_2		\overline{DA}		0	2ax ₂	2√2az ₂	0									
x ₂	√2	y ₂	z ₂	1	\overline{DAB}		\vec{n}_2		√2, 1, 1					11									
cos	\vec{n}_1, \vec{n}_2	$\frac{\vec{n}_1 \cdot \vec{n}_2}{ \vec{n}_1 \vec{n}_2 }$		$\frac{3}{\sqrt{5}}$		$\frac{3\sqrt{5}}{2}$								10									
\overline{DAB}	\overline{DMN}														12								
											$\frac{3\sqrt{5}}{10}$												
22.															12								
P	x, y	k _{PA}		$\frac{y \sqrt{3}}{x} x$		0		k _{PB}		$\frac{y \sqrt{3}}{x} x$		0		1									
	$\frac{y \sqrt{3}}{x}$	$\frac{y \sqrt{3}}{x}$	$\frac{3}{2}$		$\frac{y^2}{3}$		$\frac{x^2}{2}$		1 x		0		3										
	F ₁ 0, 1, F ₂ 0, 1							PF ₁		PF ₂		4											
C, D, E	AC, AD, AE								k _{AD} k _{AC}		0		k _{AD} k _{AE}		1		5						
	k _{AE} k _{AC}}		1																				
l _{DE} : y	kx		m		D x ₁ , kx ₁		m		E x ₂ , kx ₂		m												
	y		kx		m																		
	$\frac{x^2}{2}$	$\frac{y^2}{3}$	1		y		2k ²		3 x ²		4kmx		2m ²		6 0		7						
	x ₁ x ₂		$\frac{4km}{2k^2 - 3}$		x ₁ x ₂		$\frac{2m^2}{2k^2 - 3}$		6		8												
k _{AD} k _{AE}	1		kx ₁ m		√3		kx ₂ m		√3		x ₁ x ₂												
	k ²		1 x ₁ x ₂		k m		√3		x ₁ x ₂		m		√3 ² 0										
2k ² m ²	2m ²		6k ²		6		4k ² m ²		4√3k ² m		2k ² m ²		4√3k ² m		6k ²		3m ²		6√3m		9 0		10
	m ²		6√3m		15		0		m		√3		5√3		m=√3		11						
	DE		0		5√3		12																