

8 5 40 .

1.  $M(-2,1,3)$   $x$

A  $(-2,1,3)$  B  $(-2,-1,-3)$  C  $(2,1,-3)$  D  $(-2,1,-3)$

2.  $\vec{a}, \vec{b}$   $|\vec{a}|=|\vec{b}|=1, \vec{a} \cdot \vec{b} = -\frac{1}{2}$

A  $30^\circ$  B  $60^\circ$  C  $120^\circ$  D  $150^\circ$

3.  $l_1: x + my + 1 = 0$   $l_2: mx + 4y + 2 = 0$  ,  $m$

A  $-2$  B  $2$  C  $\pm 2$  D  $2, 4$

4.  $O-ABC$   $\vec{OA}=\vec{a}$   $\vec{OB}=\vec{b}$   $\vec{OC}=\vec{c}$   $\vec{AN}=\vec{NB}, \vec{BM}=2\vec{MC}$   $\vec{MN}=\vec{\quad}$

A  $\frac{1}{2}\vec{a} + \frac{1}{6}\vec{b} - \frac{2}{3}\vec{c}$  B  $\frac{1}{2}\vec{a} - \frac{1}{6}\vec{b} + \frac{2}{3}\vec{c}$  C  $\frac{1}{2}\vec{a} - \frac{1}{6}\vec{b} - \frac{1}{3}\vec{c}$  D  $\frac{1}{2}\vec{a} + \frac{1}{6}\vec{b} + \frac{1}{3}\vec{c}$

5.  $x \sin \alpha - y + 2 = 0$

A  $[0, \pi]$  B  $[0, \frac{\pi}{4}] \cup [\frac{3\pi}{4}, \pi)$  C  $[0, \frac{\pi}{4}]$  D  $[0, \frac{\pi}{4}] \cup (\frac{\pi}{2}, \pi)$

6.  $P(-2,0)$   $l: (1+3\lambda)x + (1+2\lambda)y = 2 + 5\lambda (\lambda \in R)$   $P$   $l$

A  $2\sqrt{3}$  B  $\sqrt{10}$  C  $\sqrt{14}$  D  $2\sqrt{15}$

7.  $ABCD - A_1B_1C_1D_1$   $P$   $M$

$\vec{PM} = \vec{PB}_1 + 7\vec{BA} + 6\vec{AA}_1 - 4\vec{A}_1D_1$   $M$

A  $BAD_1$  B  $BA_1D$  C  $BA_1D_1$  D  $AB_1C_1$

8.  $O-xyz$   $P(x_0, y_0, z_0)$   $\vec{n} = (a, b, c)$

$\alpha$   $a(x-x_0) + b(y-y_0) + c(z-z_0) = 0$   $P(x_0, y_0, z_0)$

$\vec{d} = (u, v, w) (uvw \neq 0)$   $l$   $\text{---}$

$\alpha$   $3x - 5y + z - 7 = 0$   $l$   $x - 3y + 7 = 0$   $4y + 2z + 1 = 0$

$l$   $\alpha$

A  $\frac{\sqrt{10}}{35}$       B  $\frac{\sqrt{7}}{5}$       C  $\frac{\sqrt{7}}{15}$       D  $\frac{\sqrt{14}}{55}$

4      5      20      .  
5      0      2      .

9.

A  $\frac{y-y_1}{x-x_1} = k$        $M(x_1, y_1)$        $k$

B  $x, y$        $a, b$        $\frac{x}{a} + \frac{y}{b} = 1$

C  $y = kx + b$        $y$        $b$

D  $A(-2, 2), B(1, 1)$        $l: ax + y + 1 = 0$        $AB$        $a$        $(-\infty, -2]$

10.      *Leonhard Euler*      1765

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$ABC$        $A(-4, 0), B(0, 4)$

$x - y + 2 = 0$        $C$

A  $(2, 0)$       B  $(0, 2)$       C  $(-2, 0)$       D  $(0, -2)$

11.       $ABCD - A_1B_1C_1D_1$

A  $(\vec{A_1A} + \vec{A_1D_1} + \vec{A_1B_1})^2 = 3\vec{A_1B_1}^2$       B  $\vec{A_1C} \cdot (\vec{A_1B_1} - \vec{A_1A}) = 0$

C  $\vec{AD_1} \perp \vec{A_1B}$        $60^\circ$       D  $ABCD - A_1B_1C_1D_1$        $|\vec{AB} \cdot \vec{AA_1} \cdot \vec{AD}|$

12.       $ABCD - A_1B_1C_1D_1$        $BC = 2AB = 2BB_1 = 6$        $E$        $BC$        $C$

$F$        $ADD_1A_1$        $B_1F, EF$        $ADD_1A_1$

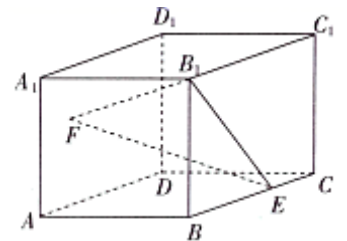
A  $A_1F \parallel BCC_1B_1$       B  $F - BB_1E$       4

C  $F$        $A_1F \parallel B_1E$       D  $A_1F$        $[\frac{5}{2}, \frac{25}{8}]$

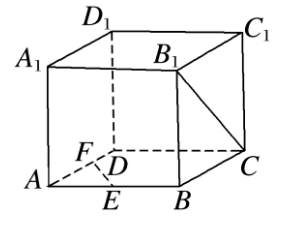
4      5      20  
2      3      .

13.       $\vec{a} = (-1, x, 5)$        $\vec{b} = (2x, -8, y)$        $x$       \_\_\_\_\_

14.       $a > 0, b > 0,$        $l_1: (a-1)x + y - 1 = 0$        $l_2: x + 2by + 1 = 0,$        $l_1 \perp l_2,$        $\frac{2}{a} + \frac{1}{b}$



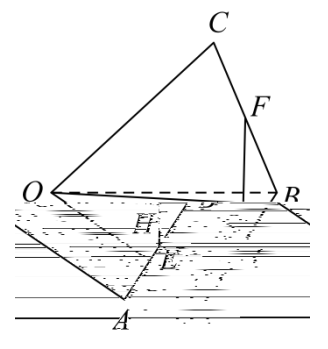
15.  $ABCD - A_1B_1C_1D_1$   $E$   $AB$   $F$   
 $AD$   $B_1C$   $EF$



16.  $OABC$   $E, F$   $AB$   $BC$   $H$   $EF$   
 $EH = \frac{1}{3}EF$   $\vec{OH} = x\vec{OA} + y\vec{OB} + z\vec{OC}$   $(x, y, z) = \underline{\hspace{2cm}}$   $\vec{OA} \perp \vec{OB}$

$\vec{OA} \perp \vec{OC}$   $|\vec{OA}| = |\vec{OB}| = |\vec{OC}| = 1$   $|\vec{OH}| = \underline{\hspace{2cm}}$   
 $\frac{6}{17}$   $\frac{70}{10}$   $12$

17.  $\Delta ABC$   $A(4,2)$   $AB$   $CM$   
 $x - y - 3 = 0$   $AC$   $BH$   $x + 2y - 2 = 0$   
 $1$   $C$   $2$   $B$   $AC$  .

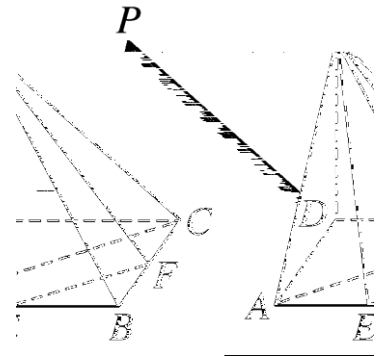


18.  $l$   $P(3,2)$   
 ( )  $l$   $3x - 2y - 1 = 0$   $l$   
 ( )  $l$   $x$   $y$   $3$   $l$   
 ( )  $l$   $x$   $y$   $A$   $B$   $\Delta AOB$   
 $l$  .

19.  $ABCD$  1  $PD \perp ABCD$   $PD=1$   $E, F$   $AB, BC$

(1)  $D$   $PEF$

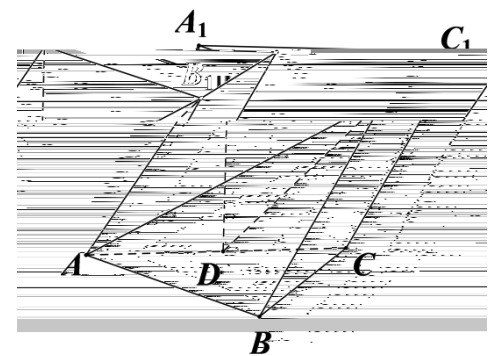
(2)  $AC$   $PEF$



20.  $ABC - A_1B_1C_1$   $AB = BC = \sqrt{2}$   $AC = 2$   $AA_1 = \sqrt{5}$   $A_1$   $ABC$

$AC$   $D$ .

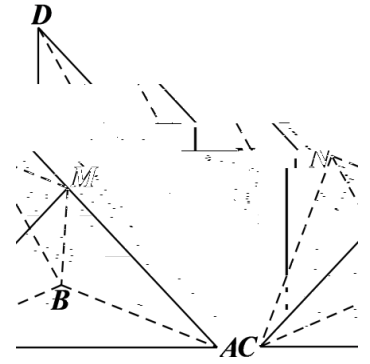
1  $BC \perp A_1B_1D$ . 2  $A - A_1B_1 - D$  .



21.  $D-ABC$ ,  $AB \perp BD$   $BC \perp CD$   $M, N$   $AD, BD$

$MC=1, AB=BD=\sqrt{2}$   $D-BA-C$   $60^\circ$

1  $MNC$   $BCD$  2  $BM$   $MNC$



22.

$ABCD - A_1B_1C_1D_1$

$AA_1D_1D \perp CC_1D_1D$

$$CC_1 = CD = D_1D = \frac{1}{2}C_1D_1 = 1.$$

1  $AD \perp CC_1D_1D$

2  $A_1C$   $CC_1D_1D$   $\frac{\pi}{3}$   $C - AA_1 - D$  .

