2020-2021

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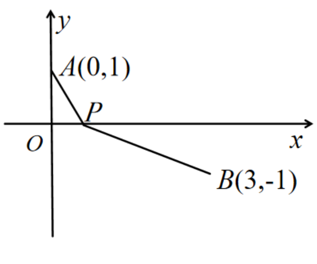
8　　5　　40　.

1.〃　$l_1:(m+2)x+(m+3)y-5=0$　$l_2:6x+(2m-1)y=5$　$m=$

A



10. $M:(x+\cos\theta)^2+(y-\sin\theta)^2=1$ $l:y=kx$

A k θ

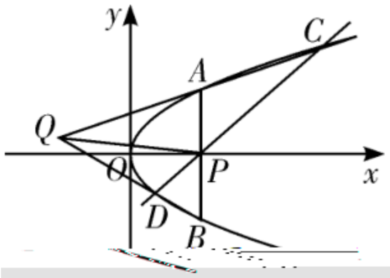
B k θ

C θ k

D k θ

11. $P(2,0)$ $x=2$ $l:x=my+2(m>0)$ $y^2=2x$ (

x) Q.



A -4

B Q $x=-2$

C P PA

D CD $\angle CQP=\angle BQP$

12. .

$\lambda(\lambda\neq 1)$, , ,

xOy , $A(-2,0),B(4,0)$, P $\frac{|PA|}{|PB|}=\frac{1}{2}$. P C,

A C $(x+4)^2+y^2=9$

B x , $\frac{|PD|}{|PE|}=\frac{1}{2}$

C A,B,P , PO $\angle APB$

D C M, $|MO|=2|MA|$

4 5 20 2 3 .

13. $(\quad)^2$ $\frac{y}{x}$ ______________.

14. $\triangle ABC$ $A(4,1)$ $C(-4,7)$ $\angle A$ ______________.

15. $F_1(-c,0),F_2(c,0)$ B F_1B

e_1,e_2 $e_1e_2=$__________ $3e_1^2+e_2^2$ __________.

16. $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b>0)$ P P x

M $\overrightarrow{PA}=\frac{1}{3}\overrightarrow{PM}$ QA B $BP\perp PQ$

BP BQ _________ _________.

6 70 17 10

12 .

17. 10 $\triangle ABC$ $A(5,1)$ AB CM $2x-y-5=0$

AC BH $x-2y-5=0$

C

$\triangle ABC$

18. 12 $A(0,4)$ $O(0,0)$ $M(x,y)$ $|MA|=3|OM|$

M

C $N\left(-\frac{1}{2},1\right)$ l C $2\sqrt{2}$ l

19. 12 $C:\frac{x^2}{a^2}+\frac{y^2}{b^2}=1(a>b>0)$ $e=\frac{\sqrt{2}}{2}$ F_1 F_2

M F_2 $\sqrt{2}+1$ F_2 l C .

C

$\triangle F_1AB$ $\angle F_1AB$ AB

l 0 x P $\angle OPA=\angle OPB$ P

.

20. 12 $E: y^2 = 2px\left(p>0\right)$ F l A E F

FA F l

$\angle BFD = 60^\circ$ BFD $\frac{4\sqrt{3}}{3}$ p F

A A B F l_1 l_1 E C

$\overrightarrow{CF} = \lambda \overrightarrow{FA}$ λ

21. 12 $C_1: \frac{x^2}{a^2} + \frac{y^2}{b^2} = 1\ (a>b>0)$ C_1 $\frac{\sqrt{3}}{2}$.

$C_2: y^2 = 2px\ \left(p>0\right)$ F_2 OF_2 Q x C_2 $2\sqrt{6}$.

C_1

C_1 T $\overrightarrow{OT} = \lambda\overrightarrow{OA} + 2\mu\overrightarrow{OB}$ C_1

$-\frac{1}{4}$. $N(\lambda, \mu)$ P $\overrightarrow{PQ} = \frac{1}{2}\overrightarrow{F_1F_2}$. $|NP| + |NQ|$

.

22. 12 $y^2 = 2px(p>0)$ P y 1

p

$Q(2,0)$ l_1 l_2 A C B D

$ABCD$

AC BD M N MN

2020-2021

8 5 40 .

1-4 BADA 5-8 DCDB

8. ΔPF_1F_2 r $S_{\Delta IPF_1}=\frac{1}{2}|PF_1|\cdot r$ $S_{\Delta IPF_2}=\frac{1}{2}|PF_2|\cdot r$ $S_{\Delta IF_1F_2}=\frac{1}{2}|F_1F_2|\cdot r$

$S_{\Delta IPF_1}-S_{\Delta IPF_2}\le\frac{\sqrt{2}}{2}S_{\Delta IF_1F_2}$ $|PF_1|-|PF_2|\le\frac{\sqrt{2}}{2}|F_1F_2|$

$|PF_1|-|PF_2|=2a$ $|F_1F_2|=2c$ $2a\le\sqrt{2}c$ $\frac{c}{a}\ge\sqrt{2}$.

4 5 20 . .

5 0 3 .

9. BC 10. BD 11. AB 12. BC

4 5 20 2 3 .

13. $\left[-\frac{\sqrt{3}}{3},\frac{\sqrt{3}}{3}\right]$ 14. $7x+y-29=0$ 15. 1 $2\sqrt{3}$ 16. $-\frac{2}{3};\frac{\sqrt{3}}{3}$

6 70 17 10

12

17. $C(m,n)$ AC BH C $2x-y-5=0$

$\begin{cases}\frac{n-1}{m-5}=-2\\2m-n-5=0\end{cases}$ $\begin{cases}m=4\\n=3\end{cases}$ $C(4,3)$.

$B(a,b)$ $M\left(\frac{a+5}{2},\frac{b+1}{2}\right)$

$\begin{cases}a+5-\frac{b+1}{2}-5=0\\a-2b-5=0\end{cases}$ $\begin{cases}a=-1\\b=-3\end{cases}$ $B(-1,-3)$. $k_{BC}=\frac{3+3}{4+1}=\frac{6}{5}$

$BC:y-3=\frac{6}{5}(x-4)$ $6x-5y-9=0$.

$|BC|=\sqrt{(4+1)^2+(3+3)^2}=\sqrt{61}$ A BC $d=\frac{|6\times5-5-9|}{\sqrt{6^2+(-5)^2}}=\frac{16}{\sqrt{61}}$

$S_{\triangle ABC}=\frac{1}{2}\times\sqrt{61}\times\frac{16}{\sqrt{61}}=8$.

18. $|MA|=3|OM|$ $\sqrt{(x-0)^2+(y-4)^2}=3\sqrt{x^2+y^2}$

$x^2+(y+\frac{1}{2})^2=\frac{9}{4}$

l $l:x=-\frac{1}{2}$

l l $y-1=k(x+\frac{1}{2})$ $kx-y+\frac{1}{2}k+1=0$

$$d=\frac{|\frac{3}{2}+\frac{k}{2}|}{\sqrt{1+k^2}}=\sqrt{\frac{9}{4}-2}=\frac{1}{2} \qquad k=-\frac{4}{3}$$

l $4x+3y-1=0$

l $4x+3y-1=0$ $x=-\frac{1}{2}$.

19. $\because\begin{cases} e=\frac{c}{a}=\frac{\sqrt{2}}{2} \\ a+c=\sqrt{2}+1 \\ a^2=b^2+c^2 \end{cases}$ $\therefore\begin{cases} a=\sqrt{2} \\ c=1 \\ b=1 \end{cases}$ $\therefore \frac{x^2}{2}+y^2=1$.

k $\triangle F_1AB$

$A\left(x_0,y_0\right)$ $\because\left|AO\right|=1$ $\therefore x_0^2+y_0^2=1$

$\because x_0^2+2y_0^2=2$ $\therefore x_0{}^2=1$ $A\left(0,1\right)$ $A\left(0,-1\right)$ $\therefore k=\pm1$

$\therefore$ AB $y=x-1$ $y=-x+1$

k $\triangle F_1AB$.

$l_{AB}:y=k\left(x-1\right)$ $l_{AF_1}:y=-\frac{1}{k}\left(x+1\right)$

$\therefore\begin{cases} y=k\left(x-1\right) \\ y=-\frac{1}{k}\left(x+1\right) \end{cases}$ $\left(k^2+1\right)x=k^2-1$

$\therefore A\left(\frac{k^2-1}{k^2+1},\frac{-2k}{k^2+1}\right)$ $\therefore \frac{\left(k^2-1\right)^2}{\left(k^2+1\right)^2}+\frac{8k^2}{\left(k^2+1\right)^2}=2$

$7k^4-6k^2-1=0$ I $k^2=1$ AB $y=-x+1$ $y=x-1$.

$P(m,0)$ $A\left(x_1,y_1\right)$ $B\left(x_2,y_2\right)$ $l_{AB}:y=k\left(x-1\right)$

$\begin{cases} y=k\left(x-1\right) \\ x^2+2y^2=2 \end{cases}$ $\therefore\left(1+2k^2\right)x^2-4k^2x+2k^2-2=0$

$\therefore x_1+x_2=\frac{4k^2}{1+2k^2}$ $x_1x_2=\frac{2k^2-2}{1+2k^2}$

$\because k_{AP}=\frac{y_1}{x_1-m}$ $k_{BP}=\frac{y_2}{x_2-m}$

$k_{AP}+k_{BP}=\frac{y_1\left(x_2-m\right)+y_2\left(x_1-m\right)}{\left(x_1-m\right)\left(x_2-m\right)}=0$ $\therefore y_1x_2+y_2x_1-m\left(y_1+y_2\right)=0$

$\therefore 2kx_1x_2-\left(k+mk\right)\left(x_1+x_2\right)+2km=0$ $\therefore 2km=4k,m=2$ $\therefore P\left(2,0\right)$.

20. l p

II $BF=FD$ $\angle BFD=60^\circ$ I BFD

I $\left|BF\right|=\frac{2p}{\sqrt{3}}$ $B\left(-\frac{p}{2},\frac{p}{\sqrt{3}}\right)$

I $S_{\triangle BFD}=\frac{1}{2}\left|BF\right|^2\sin 60^\circ=\frac{4}{3}\sqrt{3}$ $\therefore p=2$

I F $\left(x-1\right)^2+y^2=\frac{16}{3}$

22. $\frac{p}{2}=1$ I $p=2$

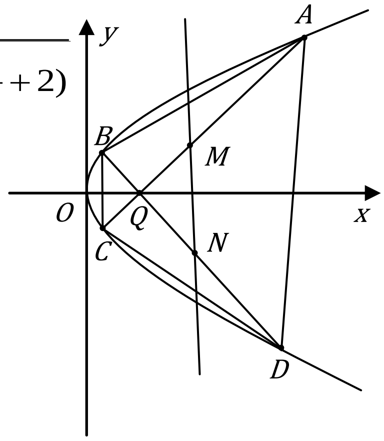
i ℓ_1 $x=2+my$ $m\neq 0$ $y^2=4x$ $y^2-4my-8=0$

$A(x_1,y_1),C(x_2y_2)$ $\begin{cases} y_1+y_2=4m \\ y_1 \bullet y_2=-8 \end{cases}$ $\Delta=16(2+m^2)>0$

I $|AC|=\sqrt{(x_1-x_2)^2+(y_1+y_2)^2}=\sqrt{(m^2+1)(y_1-y_2)^2}$

$=\sqrt{(m^2+1)[(y_1-y_2)^2-4y_1y_2]}$

$|BD|=4\sqrt{\frac{1}{m^4}+\frac{3}{m^2}+2}$



$S_{ABCD}=\frac{1}{2}|AC|\bullet|BD|=8\sqrt{(m^4+3m^2+2)(\frac{1}{m^4}+\frac{3}{m^2}+2)}$

$=8\sqrt{2(m^4+\frac{1}{m^4})+9(m^2+\frac{1}{m^2})+14}$

$=8\sqrt{2(m^2+\frac{1}{m^2})^2+9(m^2+\frac{1}{m^2})+10}$

$t=m^2+\frac{1}{m^2}$ $t\geq 2$ I $S_{ABCD}=8\sqrt{2t^2+9t+10}$

II $y=2t^2+9t+10$ $[2,+\infty)$

I $S_{ABCD}\geq 8\sqrt{36}=48$ $t=2$ $m=\pm 1$

I $ABCD$ 48 .

ii $y_1+y_2=4m,$ I $y_M=\frac{y_1+y_2}{2}=2m$ I $x_M=2+my_M=2+2m^2$

I $M(2+2m^2,2m)$

$N(2+\frac{2}{m^2},-\frac{2}{m})$

I $(y-2m)(\frac{2}{m^2}-2m^2)=(-\frac{2}{m}-2m)(x-2-2m^2)$

2 2

$y=0$ $x=4$

I MN $(4,0)$.

i

$S_{ABCD}=\frac{1}{2}|AC|\bullet|BD|=8\sqrt{(m^2+1)(m^2+2)}\bullet\sqrt{(\frac{1}{m^2}+1\ (\frac{1}{m^2}+2)}$

$=8\sqrt{\left[(m^2+1)(\frac{1}{m^2}+1\ \right]\left[(m^2+2\ (\frac{1}{m^2}+2)\right]}=8\sqrt{(2+m^2+\frac{1}{m^2})(5+\frac{2}{m^2}+2m^2)}$

$\geq 8\sqrt{(2+2)(5+2\times 2)}=48$ $m=\pm 1$.