

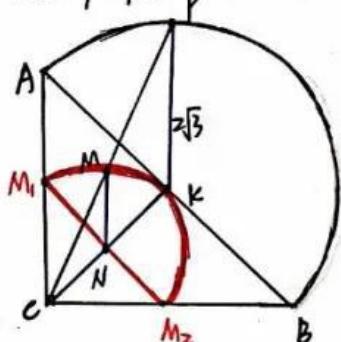
## 武昌区九年级上学期期中考试答案(第1页)

## 一、选择题

1-5. CBCBA

6-10. DC CCB

[第10题解析]:



取AB中点K,连接CK,取CK中点N.

$$\text{则 } MN = \frac{1}{2}PK = \sqrt{3}$$

故M轨迹:以N为圆心,半径为sqrt(3)的圆上.

$$\therefore l_m = \frac{180 \cdot \pi \cdot \sqrt{3}}{180} = \sqrt{3}\pi$$

## 二、填空题

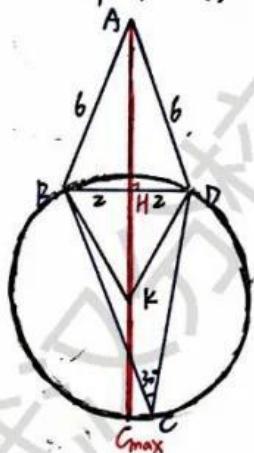
11. -6

12. (3,-1)

13. 50°

14.  $k \leq \frac{1}{3}$  且  $k \neq 0$ 15.  $\sqrt{10}$  或 116.  $4\sqrt{2} + 2\sqrt{3} + 4$ 

[第16题解析]: (30°对边)



以BD为边在BD下方作另一边△BDK.

则C轨迹:以K为圆心,以KD=4为半径的圆上.

$$\begin{aligned} \text{故 } AC_{\max} &= AK + Y \\ &= AH + HK + Y \\ &= 4\sqrt{2} + 2\sqrt{3} + 4. \end{aligned}$$

## 三、解答题

17.  $x_1 = 2 + \sqrt{3}, x_2 = 2 - \sqrt{3}$

18.  $y = -(x-1)^2 + 4$

①  $(1, 4)$

②  $-1 < x < 4$

19. 解:由题:  $a^2 = 2021 - a$ ,  $a+b = -1$ 

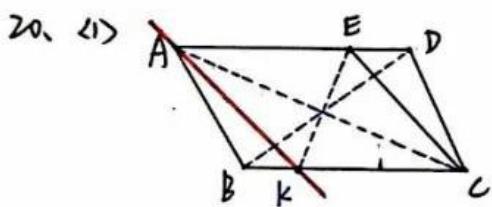
$$\begin{aligned} \therefore a^2 + 2a + b &= 2021 - a + 2a + b \\ &= 2021 + a + b \\ &= 2021 + (-1) \\ &= 2020 \end{aligned}$$

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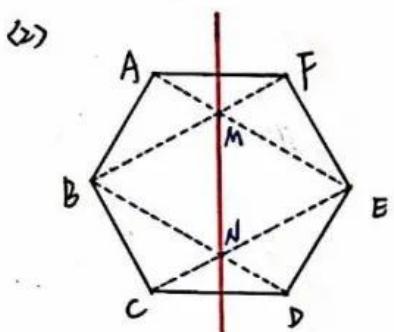
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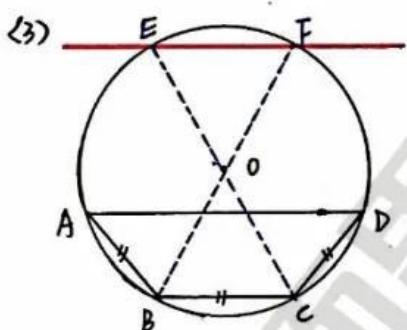
## 武昌区九年级上学期期中考试答案(第2页)



直线AK即为所求。



直线MN即为所求。



直线EF即为所求。

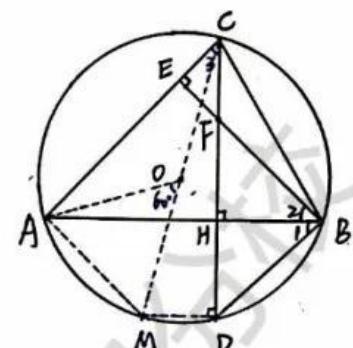
21. (1) 证明: 如图,  $\angle 1 = \angle 3$

$$\text{又: } \angle 1 = \angle 2$$

$\therefore \angle 2 = \angle 3$

$$\therefore \triangle BHD \cong \triangle BH\bar{F} (AAS)$$

$\therefore HD = HF$ .



(2) 连接CO并延长交OO于M, 连OA, AM, DM

$$\text{则 } CO \perp DM. \angle COA = \angle CBA = 120^\circ$$

$$\therefore DM \parallel AB. \angle AOM = 60^\circ$$

故  $\widehat{AM} = \widehat{BD}$ ,  $\triangle AOM$  为等边  $\triangle$

$$\therefore BD = AM = OM$$

即  $BD$  等于  $OO$  半径.

或等角证  $\triangle BOD$  为等边  $\triangle$ .

$$22. (1) \text{销售量} = 50 - \frac{x-180}{10} = -\frac{1}{10}x + 68$$

$$\therefore \text{利润} y = (-\frac{1}{10}x + 68)(x - 20)$$

$$= -\frac{1}{10}x^2 + 70x - 1360$$

$$\begin{cases} x \geq 180 \\ -\frac{1}{10}x + 68 \geq 35 \end{cases} \Rightarrow 180 \leq x \leq 330 \text{ 且 } x \text{ 为 } 10 \text{ 的整数倍.}$$

$$(2) y = -\frac{1}{10}x^2 + 70x - 1360$$

$$= -\frac{1}{10}(x-350)^2 + 10890$$

$\therefore -\frac{1}{10} < 0$ . 对称轴为  $x = 350$

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武昌区九年级上学期期中考试答案(第3页)

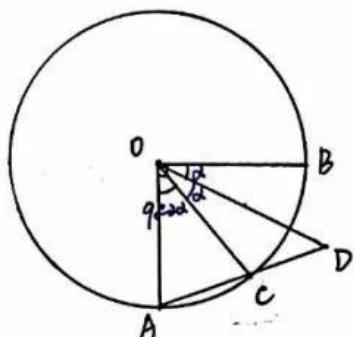
六、当  $180 \leq x \leq 330$  时,  $y$  随  $x$  增大而增大.

故当  $x=330$  时,  $y_{\max}=10850$  (元)

$$(3) \text{ 全 } y = 10400, x_1 = 280, x_2 = 420.$$

$\Rightarrow 280 \leq x \leq 330$  且  $x$  为 10 的整数倍.

23. (1)



$$\text{设 } \angle BOD = \angle COD = \alpha$$

$$R1 \angle AOC = 90^\circ - 2\alpha$$

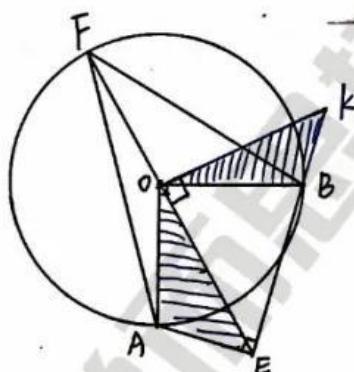
$$\triangle AOC \text{ is } \angle A = \angle ACO = \alpha + 45^\circ$$

$$\angle ACD = \angle ACO - \angle COD$$

$$= (\alpha + 45^\circ) - \alpha$$

$$= 45^\circ$$

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作OK $\perp$ OE交EB延长线于K

$\triangle DOB \cong \triangle OAE$  (ASA)

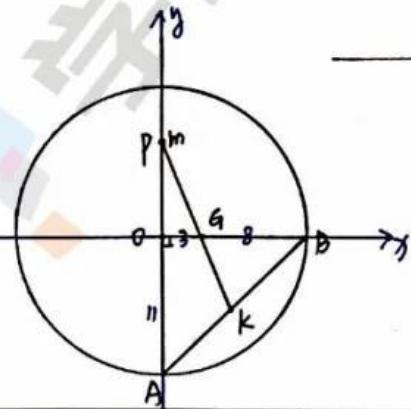
$$\nabla \cdot B = AE$$

$$\text{故 } EB + EA = Ek = \sqrt{2} DE = \sqrt{2}(6 - r)$$

Rt $\triangle$  OAB 中.  $AB = \sqrt{2}y$

$$\therefore C_{\triangle ABE} = EA + EB + AB = \sqrt{2}(6-y) + \sqrt{2}y = 6\sqrt{2}$$

(3)



如图,以O为原点建立平面直角坐标系.

设  $P(0, m)$  则  $PG: y = -\frac{m}{3}x + m$

$$\text{联立} \begin{cases} PG: y = -\frac{m}{3}x + m \\ AB: y = x - 1 \end{cases}$$

$$\text{得: } x_k = \frac{3(m+1)}{m+3}$$

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## 武昌区九年级上学期期中考试答案(第4页)

$$\begin{aligned} \therefore S_{\triangle APk} &= \frac{1}{2} \cdot AP \cdot x_k = \frac{1}{2} (m+1) \cdot \frac{3(m+1)}{m+3} \\ &= \frac{3}{2} \cdot \frac{(m+1)^2}{m+3} = \frac{3}{2} \cdot \frac{(m+3)^2 + 16(m+3) + 64}{m+3} \\ &= \frac{3}{2} \left[ (m+3) + \frac{64}{m+3} + 16 \right] \geq \frac{3}{2} (2\sqrt{64} + 16) = 48 \end{aligned}$$

即  $S_{\triangle APk}$  最小值为 48.

24. (1)  $y = ax^2 + 4a$

(2) 过 N 作 NK 垂直于 MD 于 k.

设 D(m, am<sup>2</sup>-2am+5a)

MD:  $y = ax + 5a \Rightarrow k(m, am+5a)$

$\therefore NK = am^2 - 3am$

$\therefore S_{\triangle DMN} = \frac{1}{2} \cdot NK \cdot |x_m - x_D| = \frac{3}{2}(am^2 - 3am) = 3$

即  $am^2 - 3am - 2 = 0$

$\Delta = 9a^2 + 8a = 0 \Rightarrow a_1 = 0$  (舍),  $a_2 = -\frac{8}{9}$ .

综上,  $a = -\frac{8}{9}$ .

(3) 由题:  $b_2: y = \frac{1}{4}x^2 + 1$

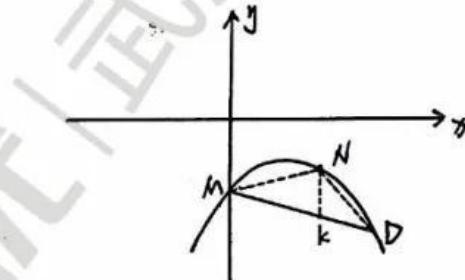
设  $C(t, \frac{1}{4}t^2 + 1)$

则  $CF = \frac{1}{4}t^2 + 1$

$$CA = \sqrt{t^2 + (\frac{1}{4}t^2 + 1 - 2)^2}$$

$$= \sqrt{(\frac{1}{4}t^2 + 1)^2}$$

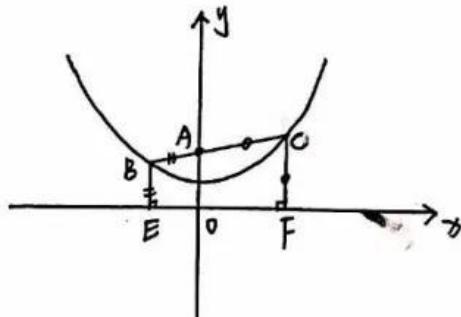
$$= \frac{1}{4}t^2 + 1$$



∴  $CF = CA$

同理:  $BE = BA$

故  $BE + CF = BA + CA = BC$



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