

## 2020 学年第二学期九年级第三次学业调研（数学试卷参考答案）

### 一、选择题（本题有 10 小题，每题 4 分，共 40 分）

1	2	3	4	5	6	7	8	9	10
D	C	D	C	B	C	A	A	D	B

### 二、填空题（本题有 6 小题，每题 5 分，共 30 分）

11.  $(m+2)(m-2)$       12.  $\underline{3}$       13.  $\underline{84}$

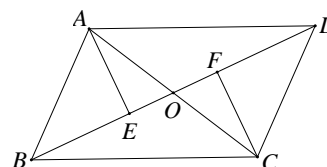
14.  $\underline{-1}$       15.  $\underline{6}$       16.  $40, \frac{40\sqrt{19}+230}{9}$

### 三、解答题（本题有 8 小题，共 80 分）

17. (1) 计算:  $|-2| - \sqrt{9} + (1 - \sqrt{3})^0 - (-5)$   
 $= 2 - 3 + 1 + 5$  (3 分)  
 $= 5$  (2 分)

(2) 化简:  $(x+1)^2 - x(x-2)$   
 $= x^2 + 2x + 1 - x^2 + 2x$  (3 分)  
 $= 4x + 1$  (2 分)

18. (1) 证明: 在  $\square ABCD$  中,  $AO=CO$ ,  
 $\because AE \perp BD, CF \perp BD$ ,  
 $\therefore \angle AEO = \angle CFO = 90^\circ$ , 又  $\because \angle AOE = \angle COF$   
 $\therefore \triangle AEO \cong \triangle CFO$ ,  $\therefore EO=FO$ . (4 分)
- (2)  $\because AE=EF=4, \therefore EO=FO=2$ ,  
 $\because \angle AEO = 90^\circ, \therefore AO = \sqrt{4^2 + 2^2} = 2\sqrt{5}$ ,  
 在  $\square ABCD$  中,  $AC = 2AO = 4\sqrt{5}$  (4 分)



(第 18 题)

19. (1) 平均数:  $\bar{x} = \frac{1}{10}(10000 + 5500 + 5000 + 3000 \times 2 + 2800 \times 3 + 2300 + 800)$  (2 分)

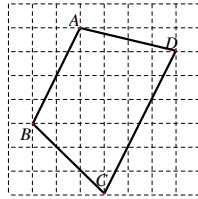
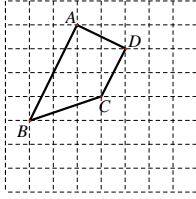
$= 3800$  (元). (1 分)

中位数: 2900 (元). (1 分)

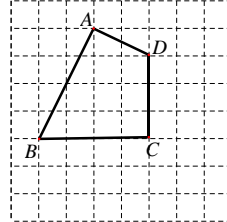
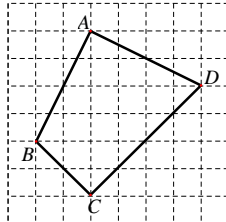
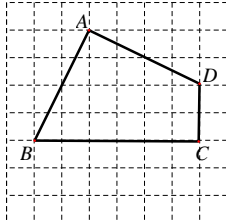
众数: 2800 (元). (1 分)

- (2) 虽然该技术部门员工五月份的月平均工资是 3800 元, 但它不能代表普通员工该月收入的一般水平. 如果除去总工程师、见习生的工资, 那么其余 8 人的平均工资为 3400 元, 比较接近这组数据的中位数和众数. 因此, 如果小李是一名普通技术人员, 他可根据该部门员工工资的中位数和众数来考虑是否应聘. (3 分)

20. (1) 4 分 (答案不唯一)



(2) 4分 (答案不唯一)



21. (1) 由题意得,

$$\begin{cases} 4 - 2b + c = 1 \\ -\frac{b}{2} = -1 \end{cases}, \text{解得} \begin{cases} b = 2 \\ c = 1 \end{cases}$$

$$\therefore y = x^2 + 2x + 1,$$

顶点坐标为  $(-1, 0)$

(4分)

(2)  $\because p + 3 = t,$

又  $\because (p + 1)^2 = t,$

$$\therefore (p + 1)^2 = p + 3,$$

解得  $p_1 = 1, p_2 = -2$  (舍去)

$$\therefore p = 1, t = 4$$

(6分)

22. (1)  $\because$  点  $D$  关于  $CE$  的对称点为  $F$

$$\therefore CE \perp DF, \angle DCE = \angle FCE$$

$$\because CD \perp AB$$

$$\therefore \angle ADC + \angle BAD = \angle ADC + \angle DCE$$

$$\text{即 } \angle BAD = \angle DCE$$

$$\therefore \angle BAD = \angle ECF \quad (4 \text{ 分})$$

(2) 记  $CE$  交  $DF$  于点  $H$

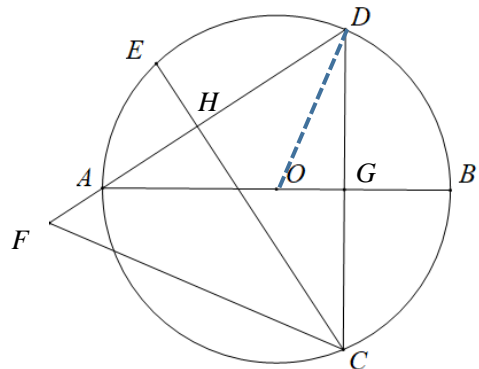
$$\because \text{点 } D \text{ 关于 } CE \text{ 的对称点为 } F$$

$$\therefore DH = HF$$

$$\because \tan \angle DCH = \tan \angle BAD = \frac{2}{3}$$

$$\text{设 } DH = HF = 4x, \text{ 则 } CD = 2\sqrt{13}x$$

$$\text{得 } AH = 4x - 9$$



$$\because \sin \angle BAD = \frac{GD}{AD} = \frac{\sqrt{13}x}{8x-9} = \frac{2}{\sqrt{13}}$$

$$\therefore x=6, \text{ 勾股得 } AG=9\sqrt{13}$$

连结  $OD$ , 设半径为  $r$ ,

$$\text{得 } r^2 = (9\sqrt{13} - r)^2 + (6\sqrt{13})^2$$

$$\therefore r = \frac{3\sqrt{13}}{2} \quad (6 \text{ 分})$$

23. (1) 由题意得,  $80(m+40)=480m$ , 解得  $m=8$ . (3 分)

(2) 设购进礼盒装  $x$  袋, 试吃装  $y$  袋, 由题意得

$$48x+8y=6000,$$

$$\text{解得 } y=750-6x$$

$$W=30x+2y=30x+2(750-6x)=1500+18x$$

$$\because y \geq 4x$$

$$\therefore 750-6x \geq 4x$$

$$\therefore x \leq 75$$

$$\because k=18 > 0,$$

$\therefore W$  随  $x$  的增大而增大

$\therefore$  当  $x=75$  时,  $W_{\max}=2850$ . (4 分)

(3) 设第二次购进礼盒装  $x$  袋, 试吃装  $3x$  袋, 由题意得

$$(30-a)x+2 \times 3x=3888$$

$$(36-a)x=3888$$

$$\therefore \frac{30-a}{48} > \frac{2}{8}$$

$$\therefore 0 < a < 18$$

$$\therefore 18 < 36-a < 36$$

$\because a$  为正整数

$$\therefore 36-a=24 \text{ 或 } 27$$

$$\therefore a=12 \text{ 或 } 9$$

(5 分)

24. (1)  $\because PD \perp AB, AD \perp AC$

$$\therefore \angle CAB + \angle BAD = \angle EDA + \angle BAD$$

$$\therefore \angle CAB = \angle EDA$$

$$\because AC=BC$$

$$\therefore \angle CBQ = \angle EDA$$

$$\because CQ \perp BC$$

$$\therefore \triangle AED \sim \triangle QCB \quad (4 \text{ 分})$$

(2) 作  $CH \perp AB$

$$\because \tan \angle CAH = \frac{1}{2}, AC = 2\sqrt{5}$$

$$\therefore AH = 4, \text{ 即 } AB = 8$$

$\because AB$  平分  $\angle CBD$

$$\therefore \angle ABD = \angle CBA = \angle CAB = \angle EAD$$

$$\therefore AC \parallel BD$$

$$\therefore \triangle ACQ \sim \triangle BDQ$$

$$\because \angle ABD + \angle BDE = 90^\circ$$

$$\therefore \angle ADB = 90^\circ$$

$$\therefore BD = \frac{16\sqrt{5}}{5}$$

$$\therefore \frac{AC}{BD} = \frac{AQ}{BQ} = \frac{5}{8}$$

$$\therefore BQ = \frac{64}{13} \quad (4 \text{ 分})$$

(3) ①  $\because \triangle APE \sim \triangle ACH$

$$\therefore AP = CP$$

$$\therefore AD = 2\sqrt{5}, PD = 5$$

$$\therefore DE = 2$$

$$\because \triangle DEQ \sim \triangle CHQ$$

$$\therefore EQ = 2FQ = \frac{4}{3}$$

$$\therefore \tan \angle BQM = \tan \angle PQE = \frac{3}{4} \quad (2 \text{ 分})$$

(3) ② I 当  $PM \parallel BC$  时

过点  $C$  作  $CH \perp AB$  交  $AB$  于点  $H$ .

$$\because PM \parallel BC \quad \therefore \angle CAB = \angle CBA = \angle PQD$$

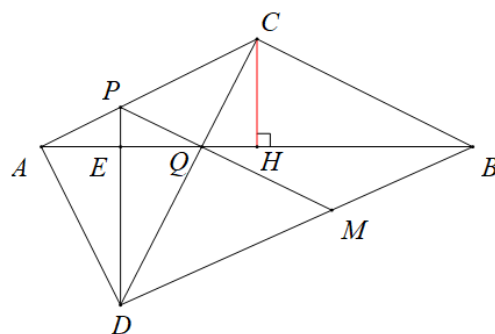
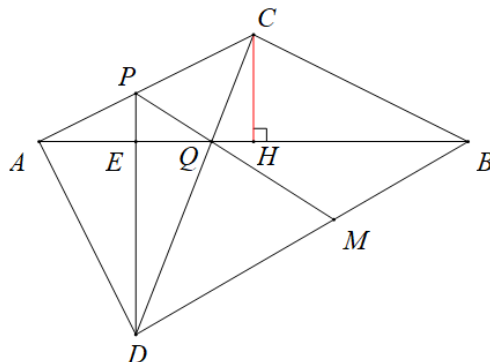
$$\therefore PM \perp CD$$

$$\therefore \triangle PEQ \sim \triangle QHC$$

$$\therefore \text{令 } QH = a, \text{ 则 } CH = 2a, AH = 4a$$

$$\therefore EQ = \frac{3}{2}a \quad \therefore ED = 3a$$

$$\therefore \frac{BM}{DM} = \frac{CQ}{DQ} = \frac{2}{3} \quad (2 \text{ 分})$$



② II 当  $PM \parallel AD$  时

过点  $C$  作  $CH \perp AB$  交  $AB$  于点  $H$ .

$\because PM \parallel AD \therefore \angle APQ = 90^\circ$

$\therefore$  令  $EQ = a$ , 则  $PE = 2a$ ,  $AE = 4a$ ,  $DE = 8a$

$\therefore \tan \angle EDQ = \frac{1}{8} = \tan \angle QCH$

$\therefore$  令  $QH = x$ , 则  $CH = 8x$ ,  $AH = 16x = BH$

$\therefore AQ = 15x$ ,  $BQ = 17x$

$\therefore \frac{BM}{DM} = \frac{BQ}{AQ} = \frac{17}{15}$  (2 分)

