

汉阳区 八年级 数学 期中考试答案 (第 1 页)

1-5. B A C C A

6-10. B A A D D

11. (1, -2)

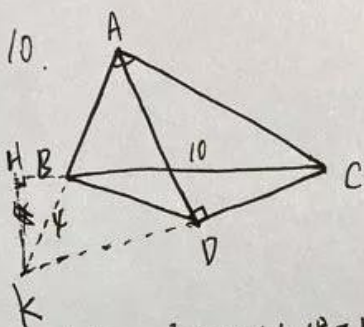
12. 35°

13. 108°

14. 3

15. 8

16. 30°



10. 延长 CD 交 AB 延长线于 K.

$\triangle ADK \cong \triangle ADC$  (ASA)

$\therefore AC = AK, KD = CD.$

$\therefore AC - AB = BK = 4.$

作  $KH \perp BC$  交 CB 延长线于 H.

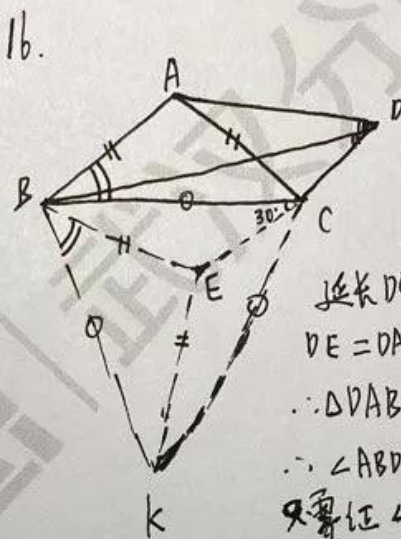
则  $KH \leq 4$ . 当 KH 与 KB 重合时取等.

$S_{\triangle BCK} = \frac{1}{2} \times BC \times KH \leq 20$

$\therefore DK = DC$

$\therefore S_{\triangle BDC} = \frac{1}{2} S_{\triangle BDK} \leq 10$

即  $S_{\triangle BDC}$  最大值为 10, 选 D.



16. 延长 DC 到 E, 使  $DE = DA$ , 连 BE.

$\therefore \triangle DAB \cong \triangle DEB$  (SAS)

$\therefore \angle ABD = \angle EBD$

只需证  $\angle ABE = 60^\circ$  即可.

以 BC 为边向下构造等边  $\triangle BCK$ , 连 EK.

$\therefore \angle BCE = 180^\circ - \angle BCD = 30^\circ$

$\therefore \angle BCE = \angle KCE = 30^\circ$

$\therefore \triangle BCE \cong \triangle KCE$  (SAS)

$\therefore EB = EK$

$\therefore EB = AB = EK = AC$

$\therefore \triangle EBK \cong \triangle ABC$  (SSS)

$\therefore \angle EBK = \angle ABC$

$\therefore \angle CBK = \angle ABE = 60^\circ$

$\therefore \angle ABD = \angle EBD = \frac{1}{2} \angle ABE = 30^\circ$

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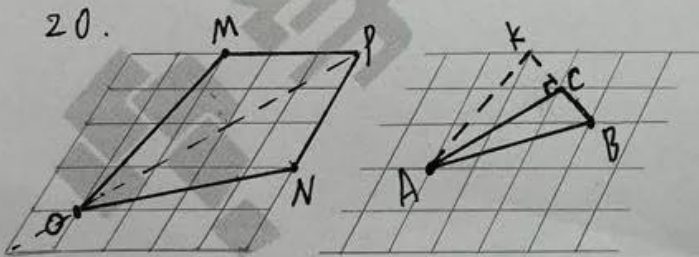
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17. 三边长为 4cm, 7cm, 7cm.  
(4, 4, 10 舍去)

18.  $\triangle ADE \cong \triangle CFE$  (AAS)  
 $\therefore AE = CE$ .

19. (1).  $\therefore DM$  垂直平分  $AB$   
 $EN$  垂直平分  $AC$   
 $\therefore DA = DB, EA = EC$   
 $\therefore CA_{ADE} = DA + DE + EA$   
 $= DB + DE + EC$   
 $= BC$   
 $= 10$

(2).  $\therefore DA = DB, EA = EC$   
 $\therefore \angle B = \angle DAB, \angle C = \angle EAC$   
设  $\angle B = \angle DAB = \alpha, \angle C = \angle EAC = \beta$   
 $\therefore \alpha + \beta + 100 = 180$   
 $\alpha + \beta = 80$   
 $\therefore \angle DAE = 100 - (\alpha + \beta) = 20^\circ$



可知  $OM = ON$ ,  
又要  $PM = PN$  则有  
 $\triangle OMP \cong \triangle ONP$  (SSS)

整条虚线上的格点均可  
(O 点除外)

构造  $AK = AB$ ,  
在  $\triangle DABK$  中,  
取  $BK$  中点  $C$  即可.  
三线合一知  $AC \perp BC$ .

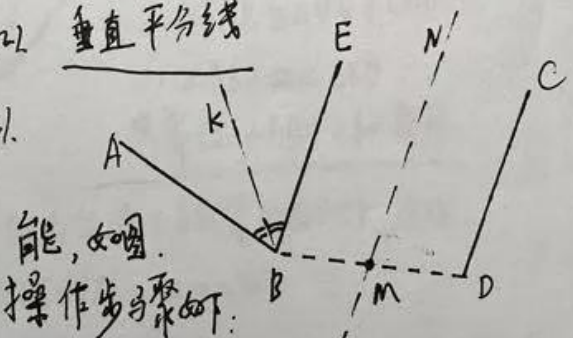
21. (1). "手拉手"模型.  
 $\triangle CBD \cong \triangle CAE$  (SAS)  
 $\therefore BD = AE$ .

(2). 设  $\angle CDB = \angle CEA = \alpha$   
 $\therefore CD = CE$   
 $\therefore \angle CDE = \angle CED = 45^\circ$   
 $\therefore \angle EDB = 45^\circ - \alpha$   
 $\angle CEB = 50^\circ - \alpha$   
 $\therefore \angle BED = 45^\circ - (50^\circ - \alpha) = \alpha - 5^\circ$   
 $\therefore \angle EBD = 180^\circ - (\alpha - 5^\circ) - (45^\circ - \alpha)$   
 $\therefore \angle EBD = 140^\circ$

22. (1). 角平分线 (图略)

(2). 垂直平分线

(3).



能, 如图.

操作步骤如下:

①. 过  $B$  作  $BE \parallel DC$ , 作  $\angle ABE$  的平分线  $BK$ .  
则  $BA$  与  $BE$  关于  $BK$  对称.

②. 连  $BD$  并取中点  $M$ , 作  $MN \parallel DC$ .  
则  $BE$  与  $DC$  关于直线  $MN$  对称.

故: 线段  $BA$  通过两次轴对称,  
与线段  $DC$  重合.

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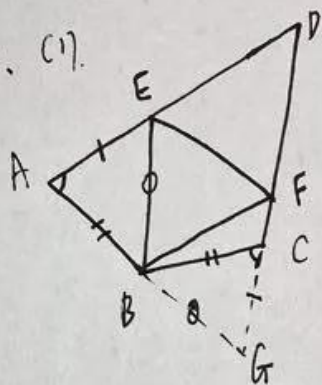
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汉阳区 八年级 数学 期中考试答案 (第 3 页)

23. (1)



延长FC到G使CG = AE, 连BG.

四边形ABCD中:

$$\therefore \angle ABC + \angle ADC = 180^\circ$$

$$\therefore \angle A + \angle ACD = 180^\circ$$

$$\text{又: } \angle BCG + \angle ACD = 180^\circ$$

$$\therefore \angle A = \angle BCG$$

$$\therefore \triangle BAE \cong \triangle BCG \text{ (SAS)}$$

$$\therefore BE = BG, \angle AEB = \angle BGC$$

$$\begin{aligned} \therefore EF &= AE + CF \\ &= CG + CF \\ &= GF \end{aligned}$$

$$\therefore \triangle BEF \cong \triangle BGF \text{ (SSS)}$$

$$\therefore \angle EBF = \angle GBF = \frac{1}{2} \angle EBG$$

$$\therefore \angle AEB + \angle BED = 180^\circ$$

$$\therefore \angle G + \angle BED = 180^\circ$$

四边形DEBG中,

$$\therefore \angle EBG + \angle D = 180^\circ, \text{ 代入}$$

$$\begin{aligned} \therefore \angle EBF &= \frac{1}{2} \angle EBG \\ &= 90^\circ - \frac{1}{2} \angle D \end{aligned}$$

(2). 延长FC到K使CK = AE, 连DK.

同理得:  $\angle BCD = \angle BAE$

$$\therefore \triangle BCK \cong \triangle BAE \text{ (SAS)}$$

$$\therefore BE = BK$$

$$\angle BEA = \angle K$$

$$\therefore EF = AE + CF = CK + CF = KF$$

$$\therefore \triangle FBE \cong \triangle FBK \text{ (SSS)}$$

$$\therefore \angle FEB = \angle K, \angle BFE = \angle BFK$$

$\therefore \angle BEA = \angle FBE$ , 即BE, BF均为角平分线.

设  $\angle BEF = \angle BED = \alpha$ ,  $\angle BFE = \angle BFD = \beta$

$$\therefore \angle EBF = 180^\circ - \alpha - \beta, \text{ ①}$$

$$\angle EDF = 180^\circ - 2\alpha - 2\beta, \text{ ②}$$

① - ② 得:

$$\angle EBF - \frac{1}{2} \angle EDF = 90^\circ$$

故可以直接写出  $\angle EBF$  与  $\angle ADC$  的关系式:

$$\angle EBF = 90^\circ + \frac{1}{2} \angle ADC$$

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24. [探究发现]:

$$\angle ADB = 60^\circ$$

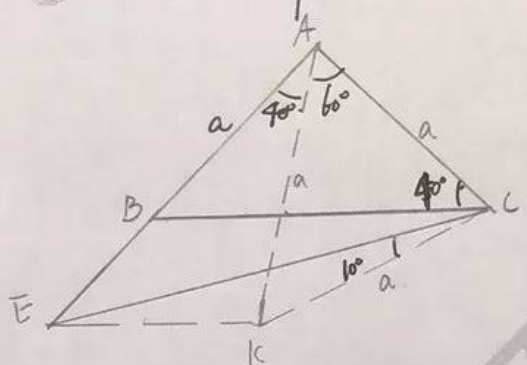
$$\angle BAC = 100^\circ$$

$$BC = BD + AD$$

[应用拓展]:

(1)  $\angle BEC = 100^\circ$

理由如下:



以AC为边向下构造等边 $\triangle ACK$ .

连接AK, CK, EK.

$$\begin{cases} AK = AC \\ \angle EAK = \angle CAB = 40^\circ \\ BC = AE \end{cases}$$

$$\triangle KAE \cong \triangle ACB \text{ (SAS)}$$

$$\therefore KE = AB$$

$$\therefore KE = AB = KC$$

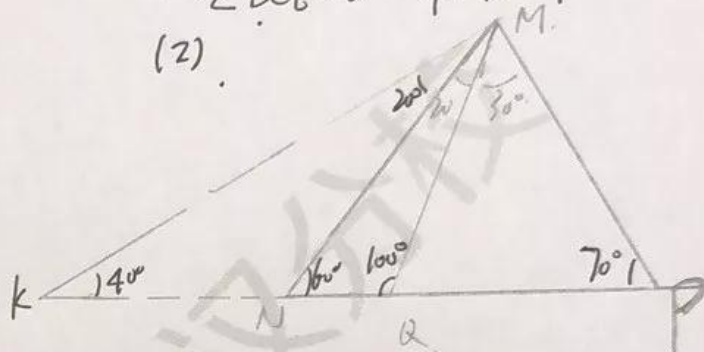
$$\text{且 } \angle EKC = 60^\circ + 100^\circ = 160^\circ$$

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$$\therefore \angle ECK = \frac{180^\circ - 160^\circ}{2} = 10^\circ$$

$$\therefore \angle BCE = 60^\circ - 40^\circ - 10^\circ = 10^\circ$$

(2)



延长PN至K, 使得 $KM = MN$ .

$$\text{则 } \angle MKQ = 30^\circ + 70^\circ = 100^\circ$$

$\therefore MN$  平分  $\angle KMQ$

由(1)中的结论知:  $NQ + MN = MK$

$$\text{又 } \angle KMP = \angle KPM = 70^\circ$$

$$\therefore KM = KP$$

$$\therefore NQ + MN = KP$$

$$\text{而 } KP = KQ + PQ = MN + PQ$$

$$\therefore NQ + MN = MN + PQ$$

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