

## 第 8 期

2 版

### 13.3.1 等腰三角形

第 1 课时

1.20°

2.C

第 2 课时

1.B

2.解:(1) $\because DE$  垂直平分  $AB$ ,

$\therefore DB=DA$ ,  $\therefore \angle B=\angle DAB$ .

$\because \angle B=40^\circ$ ,  $\therefore \angle DAB=\angle B=40^\circ$ .

$\therefore \angle ADC=\angle B+\angle DAB=80^\circ$ .

(2) 证明  $\because \angle DAC=\angle BAC-\angle DAB=120^\circ-40^\circ=80^\circ=\angle ADC$ ,

$\therefore CA=CD$ ,  $\therefore \triangle ACD$  为等腰三角形.

### 13.3.2 等边三角形

第 1 课时

1.D

2.D

3.A

4.解:(1) $\because \angle BAC=60^\circ$ ,  $\angle C=70^\circ$ ,

$\therefore \angle ABC=180^\circ-60^\circ-70^\circ=50^\circ$ .

$\therefore BE$  平分  $\angle ABC$ ,

$\therefore \angle FBD=\frac{1}{2}\angle ABC=25^\circ$ .

$\because AD\perp BC$ ,  $\therefore \angle BDF=90^\circ$ .

$\therefore \angle AFB=\angle FBD+\angle BDF=115^\circ$ .

(2) 证明  $\because \angle ABE=30^\circ$ ,  $BE$  平分

$\angle ABC$ ,

$\therefore \angle ABC=60^\circ$ .

$\therefore BD=DC$ ,  $AD\perp BC$ ,

$\therefore \triangle ABD\cong\triangle ACD$ .

$\therefore AB=AC$ ,  $\therefore \triangle ABC$  是等边三角形.

第 2 课时

1.A

2.C

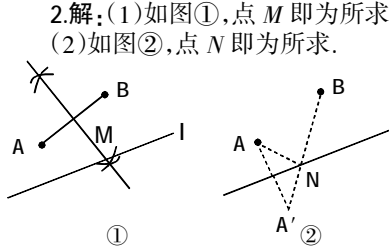
3.3

### 13.4 课题学习 最短路径问题

1.B

2.解:(1)如图①,点  $M$  即为所求.

(2)如图②,点  $N$  即为所求.



(第 2 题图)

3~4 版

### 一、选择题

1~5.BCBCD 6~10.CCCCC

### 二、填空题

11.65° 12.4 13.3 14.5 15.2

### 三、解答题(一)

16.证明: $\because \angle BAC=75^\circ$ ,  $\angle ACB=35^\circ$ ,

$\therefore \angle ABC=180^\circ-\angle BAC-\angle ACB=70^\circ$ .

$\therefore BD$  平分  $\angle ABC$ ,

$\therefore \angle DBC=\frac{1}{2}\angle ABC=35^\circ$ .

$\therefore \angle DBC=\angle ACB=35^\circ$ .

$\therefore DB=DC$ .

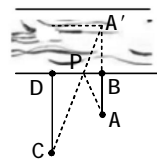
$\therefore \triangle BCD$  为等腰三角形.

17.解:如图,作点  $A$  关于河岸的

对称点  $A'$ ,连接  $CA'$  交河岸于点  $P$ ,则

$PC+PA=PC+PA'=CA'$  最短,故牧童应

将马牵到河边的  $P$  点.



(第 17 题图)

18.解: $\because \triangle ABC$  是等边三角形,

$\therefore \angle B=\angle ACB=60^\circ$ .

$\therefore DE\parallel AB$ ,  $\therefore \angle EDC=\angle B=60^\circ$ .

$\therefore EF\perp DE$ ,  $\therefore \angle DEF=90^\circ$ .

$\therefore \angle F=90^\circ-\angle EDC=30^\circ$ .

$\therefore \angle ACB=60^\circ$ ,  $\therefore \angle EDC=60^\circ$ ,

$\therefore \triangle EDC$  是等边三角形.

$\therefore ED=CD=3$ .

$\therefore \angle DEF=90^\circ$ ,  $\angle F=30^\circ$ ,

$\therefore DF=2DE=6$ .

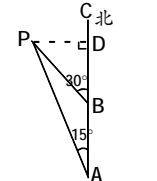
$\therefore CF=DF-CD=6-3=3$ .

### 四、解答题(二)

19.解:轮船继续向前航行,无触礁

的危险.

理由:如图,过点  $P$  作  $PD\perp AC$  于点  $D$ .



(第 19 题图)

依题意,得  $AB=2\times 20=40$ (海里).

$\therefore \angle PAB=15^\circ$ ,  $\angle PBC=30^\circ$ ,

$\therefore \angle APB=\angle PBC-\angle PAB=15^\circ$ .

$\therefore \angle A=\angle APB=15^\circ$ .

$\therefore PB=AB=40$ (海里).

在  $\text{Rt}\triangle PBD$  中,  $\angle PBD=30^\circ$ ,

$\therefore PD=\frac{1}{2}PB=20$ (海里) $>18$ (海里).

$\therefore$  轮船继续向前航行,无触礁的危险.

20.解:(1)证明  $\because EB$  平分  $\angle DEC$ ,

$\therefore \angle DEB=\angle BEC$ ,  $\therefore DE\parallel BC$ ,

$\therefore \angle DEB=\angle EBC$ ,  $\therefore \angle BEC=\angle EBC$ .

$\therefore BC=CE$ .

(2) $\because BC=CE$ ,  $CE=AB$ ,  $\therefore BC=BA$ .

$\therefore \angle C=\angle A$ . 设  $\angle C=\angle A=x$ .

$\therefore EA=EB$ ,  $\therefore \angle ABE=\angle A=x$ .

$\therefore \angle EBC=\angle BEC=\angle A+\angle ABE=2x$ .

$\therefore 2x+2x+x=180^\circ$ , 解得  $x=36^\circ$ .

$\therefore \angle C=x=36^\circ$ .

21.解:(1)证明  $\because \triangle ABC$  是等边

三角形,

$\therefore \angle B=\angle C=60^\circ$ .

$\therefore EF\parallel AB$ ,  $\therefore \angle EFC=\angle B=60^\circ$ .

$\therefore \triangle EFC$  是等边三角形.

(2) $\because \triangle ABC$  是等边三角形,

$\therefore \angle A=60^\circ$ ,  $AC=AB$ .

$\therefore DE\perp AC$ , 即  $\angle AED=90^\circ$ ,

$\therefore \angle ADE=90^\circ-60^\circ=30^\circ$ .

$\therefore AE=2\text{cm}$ ,  $\therefore AD=2AE=4\text{cm}$ .

$\therefore$  点  $D$  是  $AB$  的中点,

$\therefore AB=2AD=8\text{cm}$ ,  $\therefore AC=AB=8\text{cm}$ .

$\therefore CE=AC-AE=6\text{cm}$ .

$\therefore \triangle EFC$  是等边三角形,

$\therefore \triangle EFC$  的周长  $=CF+CE+EF=3CE=$

18cm.

### 五、解答题(三)

22.解:(1)证明:① $\because AD\parallel BE$ ,

$\therefore \angle ADB=\angle DBC$ .

$\therefore BD$  平分  $\angle ABC$ ,

$\therefore \angle ABD=\angle DBC$ .

$\therefore \angle ABD=\angle ADB$ ,  $\therefore AB=AD$ .

② $\because AD\parallel BE$ ,  $\therefore \angle ADC=\angle DCE$ .

由①知  $AB=AD$ . 又  $\because AB=AC$ ,

$\therefore AC=AD$ ,  $\therefore \angle ACD=\angle ADC$ .

$\therefore \angle ACD=\angle DCE$ .

$\therefore CD$  平分  $\angle ACE$ .

(2) $\angle BDC=\frac{1}{2}\angle BAC$ . 证明如下:

$\because BD, CD$  分别平分  $\angle ABE, \angle ACE$ ,

$\therefore \angle DBC=\frac{1}{2}\angle ABC, \angle DCE=\frac{1}{2}\angle$

$\angle ACE$ .

$\therefore \angle BDC+\angle DBC=\angle DCE$ ,

$\therefore \angle BDC+\frac{1}{2}\angle ABC=\frac{1}{2}\angle ACE$ .

$\therefore \angle BAC+\angle ABC=\angle ACE$ ,

$\therefore \angle BDC+\frac{1}{2}\angle ABC=\frac{1}{2}\angle ABC+$

$\frac{1}{2}\angle BAC$ .

$\therefore \angle BDC=\frac{1}{2}\angle BAC$ .

23.解:(1)如图①,连接  $BF$  并延

长交  $AC$  于点  $H$ .

$\therefore FG$  是  $BE$  的垂直平分线,

$\therefore FE=FB$ .

$\therefore \angle FEB=\angle FBE$ .

$\therefore \angle HFE=2\angle FBE$ .

$\therefore \triangle ABC$  为等边三角形,  $AD\perp BC$ ,

$\therefore FD$  是  $BC$  的垂直平分线.

$\therefore FB=FC$ .

$\therefore \angle FBC=\angle FCB$ .

$\therefore \angle HFC=2\angle FBC$ .

$\therefore \angle EFC=\angle HFE+\angle HFC=2(\angle FBE+$

$\angle FBC)=2\angle ABC=120^\circ$ .

(2)补全图形如图②,  $\angle CAD=\angle FCE$ .

证明:连接  $BF$ .

由(1),可知  $\angle FEB=\angle FCA$ .

$\therefore \angle FEB+\angle AME+\angle MAE=180^\circ$ ,

$\angle FCA+\angle FMC+\angle EFC=180^\circ$ ,

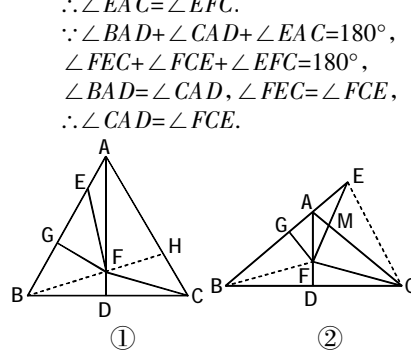
$\therefore \angle EAC=\angle EFC$ .

$\therefore \angle BAD+\angle CAD+\angle EAC=180^\circ$ ,

$\angle FEC+\angle FCE+\angle EFC=180^\circ$ ,

$\angle BAD=\angle CAD, \angle FEC=\angle FCE$ ,

$\therefore \angle CAD=\angle FCE$ .



(第 23 题图)

## 数学 广东

### 第 5 期

2 版

### 12.2 三角形全等的判定(二)

第 3 课时

1.A

2.证明: $\because AB\perp AC, AD\perp AE$ ,

$\therefore \angle BAE+\angle CAE=90^\circ, \angle BAE+$

$\angle BAD=90^\circ$ .

$\therefore \angle CAE=\angle BAD$ .

在  $\triangle ABD$  和  $\triangle ACE$  中,

$\begin{cases} \angle BAD=\angle CAE, \\ AB=AC, \\ \angle ABD=\angle ACE, \end{cases}$

$\therefore \triangle ABD\cong\triangle ACE(\text{ASA})$ .

$\therefore BD=CE$ .

3.答案不唯一,如  $\angle A=\angle D$  等

4.证明: $\because AC\parallel DF$ ,  $\therefore \angle ACB=\angle F$ .

在  $\triangle ABC$  和  $\triangle DEF$  中,

$\begin{cases} \angle ACB=\angle F, \\ \angle A=\angle D, \\ AB=DE, \end{cases}$

$\therefore \triangle ABC\cong\triangle DEF(\text{AAS})$ .

$\therefore BC=EF$ .

$\therefore BC-CE=EF-CE$ , 即  $BE=CF$ .

第 4 课时

1. $BC=BD$  或  $AC=AD$

2.证明:在  $\text{Rt}\triangle ABC$  和  $\text{Rt}\triangle DCB$  中,

$\begin{cases} BC=CB, \\ AC=BD, \end{cases}$

$\therefore \text{Rt}\triangle ABC\cong\text{Rt}\triangle DCB(\text{HL})$ .

$\therefore \angle ABC=\angle DCB, \angle ACB=\angle DBC$ .

$\therefore \angle ABC-\angle DBC=\angle DCB-\angle ACB$ ,

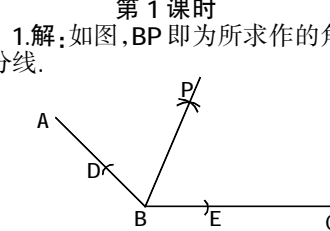
即  $\angle ABE=\angle DCE$ .

12.3 角的平分线的性质

第 1 课时

1.解:如图,  $BP$  即为所求作的角的

平分线.



(第 1 题图)

2.200

3.5

第 2 课时

1.证明: $\because DE\perp AB, DF\perp AC$ ,

$\therefore \angle E=\angle DFC=90^\circ$ .

在  $\text{Rt}\triangle BDE$  和  $\text{Rt}\triangle CDF$  中,

$\begin{cases} BD=CD, \\ \angle E=\angle DFC, \end{cases}$

$\therefore \text{Rt}\triangle BDE\cong\text{Rt}\triangle CDF(\text{HL})$ .

$\therefore DE=DF$ ,  $\therefore AD$  平分  $\angle BAC$ .

2.38°

3~4 版

### 一、选择题

1~5.DBCBD 6~10.AACBB

### 二、填空题

11.8 12.1m 13.2 14. $\frac{63}{2}$  15.5

## 八年级(人教)答案页第 2 期

2023-2024 学年



②

### 三、解答题(一)

16.证明: $\because EF\parallel BC$ ,

$\therefore \angle DFE=\angle ACB$ .

$\because AB\parallel DE$ ,  $\therefore \angle A=\angle D$ .

在  $\triangle ABC$  和  $\triangle DEF$  中,

$\begin{cases} \angle A=\angle D, \\ AC=DF, \\ \angle ACB=\angle DFE, \end{cases}$

$\therefore \triangle ABC\cong\triangle DEF(\text{ASA})$ .

17.证明: $\because BD=CE$ ,

$\therefore BD+DE=CE+DE$ .

$\therefore BE=CD$ .

在  $\triangle BEF$  和  $\triangle CDG$  中,

$\begin{cases} \angle F=\angle G, \\ \angle B=\angle C, \\ BE=CD, \end{cases}$

$\therefore \triangle BEF\cong\triangle CDG(\text{AAS})$ .

## 一、选择题

1~5.CDAAD 6~10.CBACB

## 二、填空题

11.4

12.50°

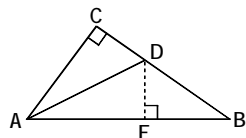
13.BF=EC 或 BC=EF 或 AB//DE

或  $\angle A = \angle D$  或  $\angle B = \angle E$ 

14.3

15.2

## 三、解答题(一)

16.证明: $\therefore AD \parallel BC$ , $\therefore \angle DAC = \angle BCA$ . $\therefore DF \parallel BE$ , $\therefore \angle DFA = \angle BEC$ .在  $\triangle AFD$  和  $\triangle CEB$  中, $\begin{cases} \angle DAF = \angle BCE, \\ AF = CE, \\ \angle DFA = \angle BEC, \end{cases}$  $\therefore \triangle AFD \cong \triangle CEB$  (ASA). $\therefore AD = CB$ .17.解: $\therefore \angle CMD = 90^\circ$ , $\therefore \angle CMA + \angle DMB = 90^\circ$ . $\therefore \angle CAM = \angle DBM = 90^\circ$ , $\therefore \angle CMA + \angle ACM = 90^\circ$ . $\therefore \angle ACM = \angle DMB$ .在  $\triangle ACM$  和  $\triangle BMD$  中, $\begin{cases} \angle A = \angle B, \\ \angle ACM = \angle BMD, \\ CM = MD, \end{cases}$  $\therefore \triangle ACM \cong \triangle BMD$  (AAS). $\therefore AC = BM = 3$  米. $\therefore AM = AB - BM = 12 - 3 = 9$  (米). $\therefore 9 \div 2 = 4.5$  (秒). $\therefore$  这个人还需要 45 秒才能到达 A 处.18.解:如图,过点 D 作  $DE \perp AB$  于点 E.

(第18题图)

 $\therefore AD$  平分  $\angle BAC$ ,  $DE \perp AB$ ,  $DC \perp AC$ , $\therefore DC = DE$ .又  $\therefore BD:DC = 2:1$ ,  $BC = 12$  cm, $\therefore DC = 12 \times \frac{1}{3} = 4$  (cm). $\therefore DE = DC = 4$  cm.

$$\therefore S_{\triangle ABD} = \frac{1}{2} \times 16 \times 4 = 32 (\text{cm}^2).$$

## 四、解答题(二)

19.解:(1)证明:在  $\triangle BPF$  和  $\triangle CEP$  中, $\begin{cases} BP = CE, \\ \angle B = \angle C, \\ BF = CP, \end{cases}$  $\therefore \triangle BPF \cong \triangle CEP$  (SAS). $\therefore PE = PF$ .(2)在  $\triangle ABC$  中, $\therefore \angle A = 44^\circ$ ,  $\angle B = \angle C$ , $\therefore \angle B = \angle C = \frac{180^\circ - 44^\circ}{2} = 68^\circ$ . $\therefore \triangle BPF \cong \triangle CEP$  (SAS). $\therefore PE = PF$ . $\therefore \angle B = \angle C = \frac{180^\circ - 44^\circ}{2} = 68^\circ$ . $\therefore \triangle BPF \cong \triangle CEP$  (SAS). $\therefore \angle BFP = \angle CPE$ . $\therefore \angle FPC = \angle B + \angle BFP = \angle FPE + \angle CPE$ , $\therefore \angle FPE = \angle B = 68^\circ$ . $\therefore \angle FPE = \angle B = 68^\circ$ .20.解:(1)证明: $\therefore$  射线 AD 平分  $\angle BAC$ , $\therefore \angle CAE = \angle FAE$ .在  $\triangle AEC$  和  $\triangle AEF$  中, $\begin{cases} AC = AF, \\ \angle CAE = \angle FAE, \\ AE = AE, \end{cases}$  $\therefore \triangle AEC \cong \triangle AEF$  (SAS). $\therefore \angle AEC = \angle AEF$ . $\therefore \angle AEB = 50^\circ$ ,  $\therefore \angle AEC = 130^\circ$ . $\therefore \angle AEF = 130^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ . $\therefore \angle BEF = \angle AEF - \angle AEB = 130^\circ - 50^\circ = 80^\circ$ .

## 五、解答题(三)

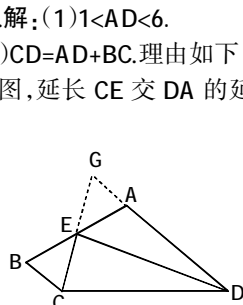
22.解:(1)可行.理由如下:

在  $\triangle ABC$  和  $\triangle DEC$  中, $\begin{cases} AC = DC, \\ \angle ACB = \angle DCE, \\ CB = CE, \end{cases}$  $\therefore \triangle ABC \cong \triangle DEC$  (SAS). $\therefore AB = DE$ . $\therefore$  方案①可行.

(2)可行.理由如下:

 $\therefore BF \perp AB$ ,  $DE \perp BF$ , $\therefore \angle B = \angle CDE = 90^\circ$ .在  $\triangle ABC$  和  $\triangle EDC$  中, $\begin{cases} \angle B = \angle CDE, \\ CB = CD, \\ \angle BCA = \angle DCE, \end{cases}$  $\therefore \triangle ABC \cong \triangle EDC$  (ASA). $\therefore AB = DE$ . $\therefore$  方案②可行.(3)  $AB \parallel DE$ .23.解:(1)  $1 < AD < 6$ .(2)  $CD = AD + BC$ .理由如下:

如图,延长 CE 交 DA 的延长线于点 G.



(第23题图)

 $\therefore AD \parallel BC$ , $\therefore \angle G = \angle ECB$ . $\therefore E$  是 AB 的中点, $\therefore AE = BE$ .在  $\triangle AEG$  和  $\triangle BEC$  中, $\begin{cases} \angle G = \angle ECB, \\ \angle AEG = \angle BEC, \\ AE = BE, \end{cases}$  $\therefore \triangle AEG \cong \triangle BEC$  (AAS). $\therefore AG = BC$ ,  $EG = EC$ . $\therefore CE \perp DE$ , $\therefore \angle DEG = \angle DEC = 90^\circ$ .在  $\triangle DEG$  和  $\triangle DEC$  中, $\begin{cases} DE = DE, \\ \angle DEG = \angle DEC, \\ EG = EC, \end{cases}$  $\therefore \triangle DEG \cong \triangle DEC$  (SAS). $\therefore DG = DC$ . $\therefore DG = AD + AG = AD + BC$ , $\therefore CD = AD + BC$ .

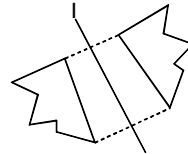
## 第7期

## 2版

## 13.1.1 轴对称

1.D 2.D 3.③④

4.解:如图,直线 l 即为所求.



(第4题图)

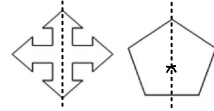
13.1.2 线段的垂直平分线的性质  
第1课时

## 1.A

2.解:(1) $\therefore DM$  是线段 AB 的垂直平分线, $\therefore DA = DB$ .同理, $EA = EC$ . $\therefore \triangle ADE$  的周长为 5, $\therefore AD + DE + EA = 5$ . $\therefore BC = DB + DE + EC = AD + DE + EA = 5$  (cm).(2) $\therefore \triangle OBC$  的周长为 13 cm, $\therefore OB + OC + BC = 13$ . $\therefore OM$  垂直平分 AB, $\therefore OA = OB$ .同理, $OA = OC$ . $\therefore 2OA + BC = 13$ . $\therefore OA = \frac{1}{2} \times (13 - 5) = 4$  (cm).

## 第2课时

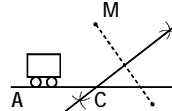
1.解:如图所示.



(第1题图)

2.解:如图,(1)连接 MN;

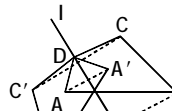
(2)作线段 MN 的垂直平分线 l,交直线 AB 于点 C,则点 C 即为所求.



(第2题图)

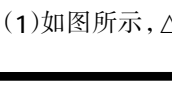
## 13.2 画轴对称图形

## 1.B

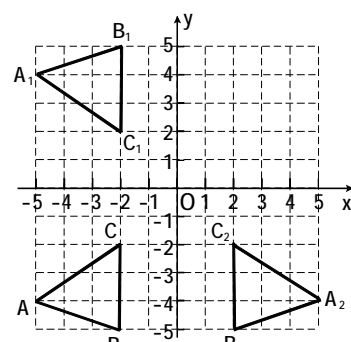
2.解:如图,四边形  $A'B'C'D$  即为所求.

(第2题图)

## 3.A

4.解:(1)如图所示,  $\triangle A_1B_1C_1$  即为所求.

(第2题图)



(第4题图)

(2)如图所示,  $\triangle A_1B_1C_1$  即为所求.

## 3~4版

## 一、选择题

1~5.ACDCC

6~10.CBDBB

11.53°

12.C

13.(-3,0)

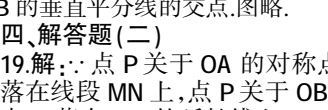
14.1

15.70°

## 三、解答题(一)

16.解: $\therefore$  四边形 ABDC 的对称轴是 AD 所在的直线, $\therefore \triangle ACD \cong \triangle ABD$ . $\therefore AC = AB = 5$ ,  $CD = BD = 7$ . $\therefore$  四边形 ABDC 的周长为  $2 \times 5 + 2 \times 7 = 24$ .

17.解:均是轴对称图形,如图所示:



(第17题图)

18.解:点 P 为  $\angle AOB$  的平分线和线段 AB 的垂直平分线的交点.图略.

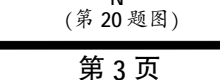
## 四、解答题(二)

19.解: $\therefore$  点 P 关于 OA 的对称点 Q 恰好落在线段 MN 上,点 P 关于 OB 的对称点 R 落在 MN 的延长线上, $\therefore PM = MQ$ ,  $PN = NR$ . $\therefore PM = 2.5$  cm,  $PN = 3$  cm,  $MN = 4$  cm, $\therefore RN = 3$  cm,  $MQ = 2.5$  cm,  $NQ = MN - MQ = 4 - 2.5 = 1.5$  (cm). $\therefore QR = RN + NQ = 3 + 1.5 = 4.5$  (cm).20.解:(1) D,  $\angle C$ .(2) $\therefore DF = BF = 6$ , $\therefore EF = ED - DF = 9 - 6 = 3$ .

故答案为:3.

(3)平行.

理由:如图,连接 BD 和 EC, AF 交 BD 于点 G.



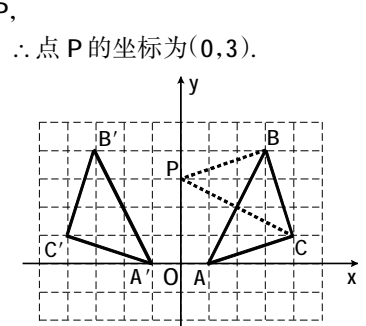
(第20题图)

 $\therefore MN \perp EC$ ,  $MN \perp DB$ , $\therefore EC \parallel BD$ . $\therefore BD$  和  $EC$  的位置关系为平行.21.解:(1) $\therefore \angle BAC = 50^\circ$ , AD 平分  $\angle BAC$ , $\therefore \angle EAD = \frac{1}{2} \angle BAC = 25^\circ$ . $\therefore DE \perp AB$ ,  $\therefore \angle AED = 90^\circ$ . $\therefore \angle EDA = 90^\circ - 25^\circ = 65^\circ$ .(2)证明: $\therefore DE \perp AB$ , $\therefore \angle AED = 90^\circ = \angle ACB$ . $\therefore AD$  平分  $\angle BAC$ ,  $\therefore \angle DAE = \angle DAC$ .又  $\therefore AD = AD$ ,  $\therefore \triangle AED \cong \triangle ACD$ . $\therefore AE = AC$ ,  $DE = DC$ . $\therefore$  点 A, D 均在线段 CE 的垂直平分线上. $\therefore$  直线 AD 是线段 CE 的垂直平分线.

## 五、解答题(三)

22.解:(1)如图,  $\triangle A'B'C'$  即为所求.(2)  $A'(-1,0)$ ,  $B'(-3,4)$ ,  $C'(-4,1)$ .(3)若  $\triangle PAB \cong \triangle CAB$ , 则  $BP = BC$ ,

如图,利用网格找点 C 关于 AB 的对称点 P,

 $\therefore$  点 P 的坐标为 (0,3).

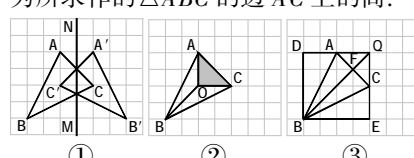
(第22题图)

23.解:(1)如图①,  $\triangle A'B'C'$  即为所求.

(2)答案不唯一,如图②.

(3)如图③,选择格点 D, E, 证明  $\triangle ABD \cong \triangle CBE$ . 于是,  $AB = CB$ .选择格点 Q, 证明  $\triangle ABQ \cong \triangle CBQ$ . 于是,  $AQ = CQ$ .

所以 BQ 为线段 AC 的垂直平分线.

设 BQ 与 AC 相交于点 F, 则 BF 为所作作的  $\triangle ABC$  的边 AC 上的高.

(第23题图)