

## 2023-2024 学年度第一学期初二期中质量抽测 答案

一、选择题（本题共 10 小题，每小题 2 分，共 20 分，只有一个选项正确）

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

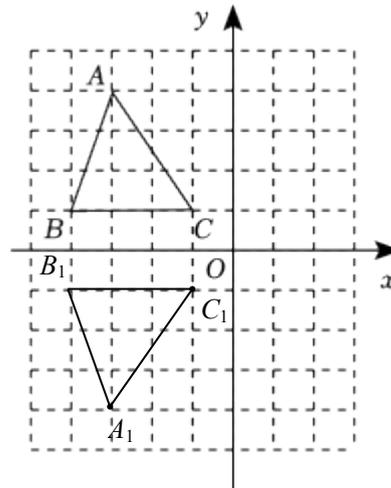
二、填空题（本题共 6 小题，每小题 3 分，共 18 分）

11. 15; 12. 30; 13. 55; 14.  $BC=EF$  或  $BE=CF$  (填一个即可); 15. 60; 16. 65.

三、解答题（本题共 4 小题，其中 17 题 6 分，18 题、19 题、20 题各 8 分，共 30 分）

17. (1) 如图， $\triangle A_1B_1C_1$  即为所求作的图形; ..... 4 分

(2)  $(-3, -4)$ ; 2. ....6 分



18. 证明:  $\because \angle 1 = \angle 2$

$$\therefore \angle 1 + \angle CAD = \angle 2 + \angle CAD$$

$$\therefore \angle CAB = \angle EAD \dots\dots\dots 3 \text{ 分}$$

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

$$\begin{cases} AB=AD \\ \angle CAB = \angle EAD, \\ AC=AE \end{cases}$$

$$\therefore \triangle ABC \cong \triangle ADE, \dots\dots\dots 7 \text{ 分}$$

$$\therefore BC = DE. \dots\dots\dots 8 \text{ 分}$$

19. 解: 根据题意得  $AB=30$ ,  $\angle A=30^\circ$ ,  $\angle PBC=60^\circ$ ,

$$\because \angle PBC = \angle P + \angle A,$$

$$\therefore \angle P = 30^\circ, \dots\dots\dots 5 \text{ 分}$$

$$\therefore \angle P = \angle A,$$

$$\therefore PB = AB = 30, \dots\dots\dots 7 \text{ 分}$$

答: 轮船与小岛的距离  $PB$  的长为 30 海里. .... 8 分

20. (1) 如图即为所求作的图形; ..... 3分

(2) 解:  $\because AB=AC,$

$$\therefore \angle ABC = \angle C,$$

$$\because \angle ABC + \angle C + \angle A = 180^\circ, \angle A = 40^\circ,$$

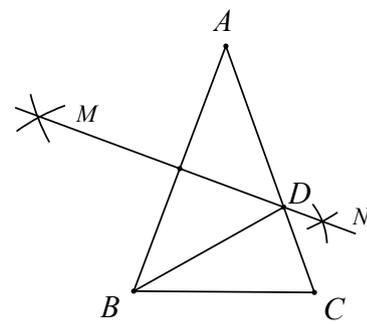
$$\therefore \angle ABC = 70^\circ,$$

$\because MN$  垂直平分线  $AB,$

$$\therefore DA = DB, \dots\dots\dots 6分$$

$$\therefore \angle A = \angle DBA = 40^\circ,$$

$$\therefore \angle DBC = \angle ABC - \angle DBA = 30^\circ, \dots\dots\dots 8分$$



答:  $\angle DBC$  的度数是  $30^\circ$  .

四、解答题 (本题共 3 小题, 其中 21 题 10 分, 22 题 8 分, 23 题 10 分, 共 28 分)

21. 证明:  $\because AC=BC,$

$$\therefore \angle A = \angle ABC,$$

$$\because \angle ACB = 90^\circ, \angle A + \angle ABC + \angle ACB = 180^\circ,$$

$$\therefore \angle ABC = \angle A = \frac{1}{2} (180^\circ - 90^\circ) = 45^\circ, \dots\dots\dots 3分$$

$\because BD$  平分  $\angle ABC,$

$$\therefore \angle ABD = \frac{1}{2} \angle ABC = 22.5^\circ \dots\dots\dots 5分$$

$$\because \angle BDE = \angle A,$$

$$\therefore \angle BDE = 45^\circ,$$

$$\therefore \angle AED = \angle ABD + \angle BDE = 22.5^\circ + 45^\circ = 67.5^\circ, \dots\dots\dots 7分$$

$$\because \angle AED + \angle A + \angle ADE = 180^\circ,$$

$$\therefore \angle ADE = 180^\circ - 45^\circ - 67.5^\circ = 67.5^\circ,$$

$$\therefore \angle ADE = \angle AED,$$

$$\therefore AD = AE, \dots\dots\dots 10分$$

$\therefore \triangle ADE$  是等腰三角形.

22. (1) (3, 1); ..... 2分

(2) (2, 1); (-2, -1) 等. .... 8分

23. (1) 在等边三角形  $ABC$  中,  $AB=8\sqrt{3}$ ,  $E$  为  $AB$  的中点,

$\therefore BE = \frac{1}{2} AB = 4\sqrt{3}$ ,  $CE \perp AB$ . ..... 2 分

$\therefore AD$  是中线,

$\therefore AD \perp BC$ .

$\therefore BP = CP$

$S_{\triangle ABC} = \frac{1}{2} BC \cdot AD = \frac{1}{2} AB \cdot CE$

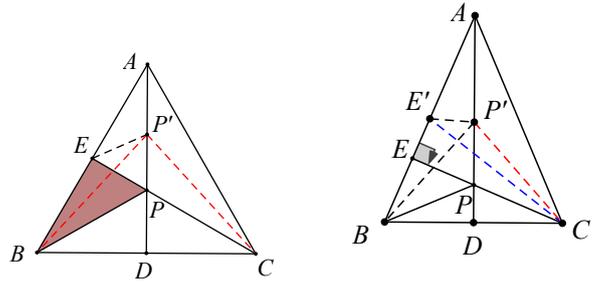
$\therefore AB = BC$ ,

$\therefore CE = AD = 12$  ..... 6 分

根据“两点之间线段最短”,  $CE = PC + PE \leq P'C + P'E$

$\triangle PBE$  周长的最小值为:  $BE + PE + PB = BE + CE = 4\sqrt{3} + 12$ ; ..... 8 分

(2) 3. .... 10 分



五、解答题 (本题共 2 小题, 24、25 题各 12 分, 共 24 分)

24. 证明: (1)  $\angle CAE + \angle CAB = 180^\circ$ . ..... 1 分

$\triangle ABC$  中,  $\angle ACB = 90^\circ$ ,

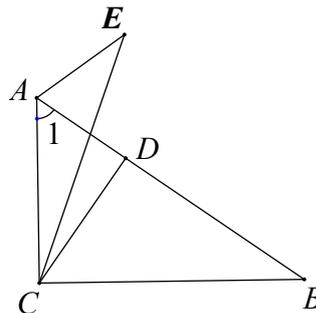
$\therefore \angle B + \angle 1 = 90^\circ$ ,

$\therefore \angle CAE = \angle BAE + \angle 1$

又  $\therefore \angle BAE = 2\angle B$

$\therefore \angle CAE + \angle CAB = 2\angle 1 + 2\angle B$  ..... 3 分

$\therefore \angle CAE + \angle CAB = 180^\circ$ .



(2) 法一：在  $AB$  上截取  $DM=AD$ ，连接  $CM$ ，延长  $EA$ ， $BC$  交于点  $N$ 。

$\because CD \perp AB$

$\therefore CA = CM$  ..... 4 分

$\therefore \angle 1 = \angle 2$

$\because \angle CAE + \angle 1 = 180^\circ$ ， $\angle 2 + \angle 3 = 180^\circ$ ， $\angle CAE + \angle 4 = 180^\circ$ ，

$\therefore \angle CAE = \angle 3$ ， $\angle 1 = \angle 4$ 。

$\because \angle ACB = 90^\circ$ ，

$\therefore \angle ACN = \angle ACB = 90^\circ$

$\therefore \angle 1 + \angle B = 90^\circ$ ， $\angle N + \angle 4 = 180^\circ$

$\therefore \angle N = \angle B$

$\therefore AN = AB$

又  $\because \angle 1 = \angle 4$

$\therefore CN = CB$

$\because CE = CB$

$\therefore CN = CE$

$\therefore \angle N = \angle E$

$\therefore \angle E = \angle B$  ..... 7 分

$\therefore \triangle ACE \cong \triangle BCM$

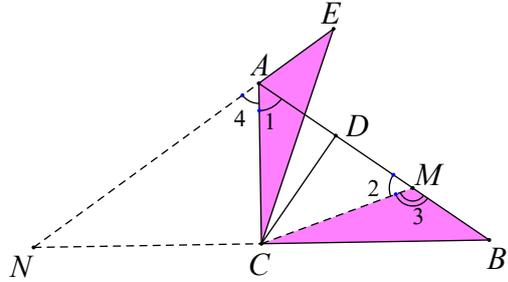
$\therefore AE = BM$ ， $S_{\triangle ACE} = S_{\triangle BCM}$  ..... 9 分

$\because BD = 2AD$ ， $DM = AD$ ，

$\therefore AB = 3BM$  ..... 11 分

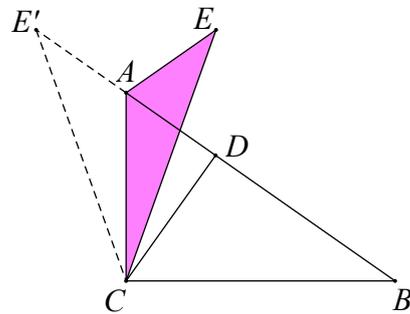
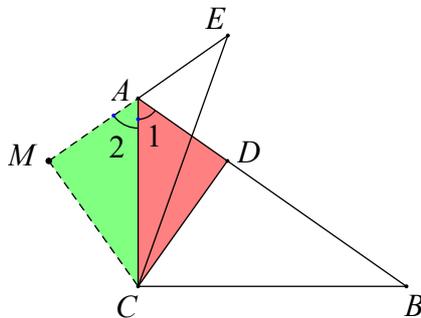
$\therefore S_{\triangle ABC} = \frac{1}{2} AB \cdot CD$ ， $S_{\triangle BCM} = \frac{1}{2} BM \cdot CD$

$\therefore S_{\triangle ABC} = 3S_{\triangle BCM}$ ， $\therefore \frac{S_{\triangle ABC}}{S_{\triangle ACE}} = 3$  ..... 12 分



(2) 法 2:

法 3



25. (1) 如图即为所求作的图形. .... 1分

(2) 证明:  $\because AB=AC$ ,

$$\therefore \angle ABC = \angle ACB,$$

$$\because \angle ABC = \angle E + \angle BCE,$$

$$\angle ACB = \angle BCD + \angle ACD,$$

$$\text{且 } \angle ACD = \angle BCE,$$

$$\therefore \angle BCD = \angle E, \dots\dots\dots 2 \text{分}$$

$$\therefore BC = BD,$$

$$\therefore \angle BCD = \angle BDC,$$

$$\therefore \angle BDC = \angle E,$$

$$\therefore CD = CE, \dots\dots\dots 3 \text{分}$$

(3) 答:  $BD = 2CG$ . .... 4分

在  $CA$  上截取  $CM = CB$ , 连接  $DM$ .

在  $\triangle CDM$  和  $\triangle CEB$  中,

$$\begin{cases} CM = CB \\ \angle ACD = \angle BCE, \\ CD = CE \end{cases}$$

$$\therefore \triangle CDM \cong \triangle CEB,$$

$$\therefore DM = BE, \angle CMD = \angle CBE, \dots\dots\dots 7 \text{分}$$

$$\therefore CF = BE,$$

$$\therefore DM = CF,$$

$$\because AB = AC,$$

$$\therefore \angle ABC = \angle ACB$$

$$\because \angle ABC + \angle CBE = 180^\circ,$$

$$\angle ACB + \angle FCG = 180^\circ,$$

$$\therefore \angle FCG = \angle CBE,$$

$$\therefore \angle FCG = \angle DMG \dots\dots\dots 10 \text{分}$$

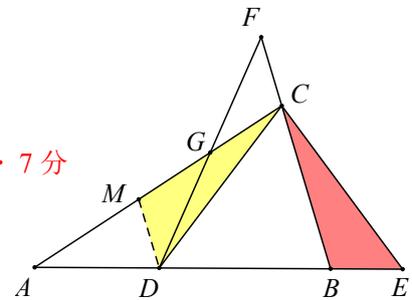
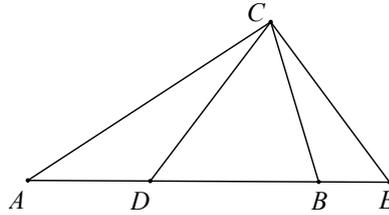
又  $\because \angle FGC = \angle DGM,$

$$\therefore \triangle CGF \cong \triangle MGD \text{ (AAS)}. \dots\dots\dots 11 \text{分}$$

$$\therefore MG = CG$$

$$\because CD = CE$$

$$\therefore BD = 2CG. \dots\dots\dots 12 \text{分}$$

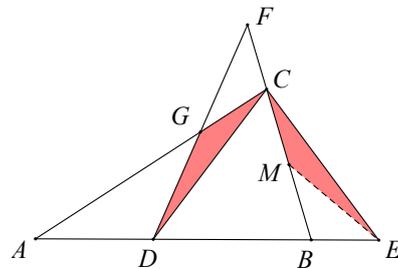


法1图

法2: 在  $CA$  上截取  $CG = CM$ , 连接  $EM$ .

证明  $\triangle CGD \cong \triangle CME$

$$\triangle CGF \cong \triangle BME$$



法2图