

第9期
3~4版

一、选择题

1~5.DBCDA

6~10.ABCBC

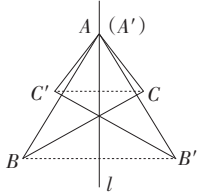
二、填空题

11.1 12.21 13.1 14.18

15.40°或100°或140°

三、解答题(一)

16.解:如图所示,△A'B'C'即为所求作.



(第16题图)

17.证明:∵AD的垂直平分线交AC于点E,BD的垂直平分线交BC于点F,

∴AE=DE,DF=BF.

∴∠A=∠EDA,∠B=∠FDB.

∴∠C=90°,∴∠A+∠B=90°.

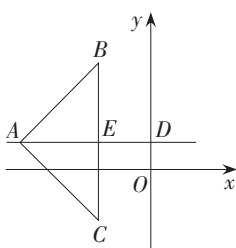
∴∠EDA+∠FDB=90°.

∴∠EDF=180°-(∠EDA+∠FDB)=90°,即DE⊥DF.

18.解:(1)(-10,2).

(2)△ABC为等腰直角三角形.

理由:如图,设直线AD与BC交于点E.



(第18题图)

∴点B关于直线AD的对称点为C,

∴BC⊥AD,BE=CE.

∴△ABE≌△ACE(SAS).

∴AB=AC.

∴点C的坐标为(-4,-4),

∴点E的坐标为(-4,2).

∴点A的坐标为(-10,2),

∴AE=CE=6.

∴∠CAE=∠C=45°.

∴AB=AC.

∴∠C=∠B=45°.

∴∠BAC=90°.

∴△ABC为等腰直角三角形.

四、解答题(二)

19.解:(1)∵AB∥CD,

∴∠ACD+∠CAB=180°.

∴∠ACD=130°,∴∠CAB=50°.

原式=-1×(-1/2)=1/2.

四、解答题(二)

19.解:解法一:×,去括号时变号错误.

解法二:×,完全平方公式计算错误.

正确计算步骤如下:

原式=1-6x+9x^2-9x^2+1

=2-6x.

20.解:(1)∵a^m=2,a^n=4,a^k=32,

∴a^(m+n-k)

=a^m·a^n÷a^k

=2×4÷32

=1/4.

(2)∵a^k÷a^3m÷a^n=a^(k-3m-n),

且a^k÷a^3m÷a^n

=32÷2^3÷4

=4÷4

=1

=a^0,

∴a^(k-3m-n)=a^0.

∴k-3m-n=0.

21.解:(1)两块空地总面积:(3a+2b)(2a+b)+(a+b)(a-b)

=6a^2+7ab+2b^2+a^2-b^2

=7a^2+7ab+b^2,

种花面积:(a-b)^2=a^2-2ab+b^2,

草坪面积:

7a^2+7ab+b^2-(a^2-2ab+b^2)=6a^2+9ab.

故计划种植草坪的面积为(6a^2+9ab)m^2.

(2)当a=30,b=10,草坪价格为30元/m^2时,

应投入的资金=(6a^2+9ab)×30=(6×30^2+9×30×10)×30=243 000(元).

五、解答题(三)

22.解:(1)①②③.

(2)原式=2 024^2-(2 024+1)(2 024-1)

=2 024^2-(2 024^2-1)

=2 024^2-2 024^2+1

=1.

(3)原式=(2-1)(2+1)(2^2+1)(2^4+1)×(2^8+1)(2^16+1)(2^32+1)

=(2^8-1)(2^8+1)(2^16+1)(2^32+1)

=(2^16-1)(2^16+1)(2^32+1)

=(2^32-1)(2^32+1)

=2^64-1.

23.解:(1)(m-n)^2;(m+n)^2-4mn.

(2)(m-n)^2=(m+n)^2-4mn.

(3)由(2),得(x-y)^2=(x+y)^2-4xy.

∴x+y=8,xy=15,

∴(x-y)^2=8^2-4×15=4.

(4)设p=2 024-a,q=a-2 023,

则p+q=1,

p^2+q^2=(2 024-a)^2+(a-2 023)^2=8.

∴(2 024-a)(a-2 023)

=pq

=(p+q)^2-(p^2+q^2)

=1-8=-7/2.

第12期

2版

14.1.4整式的乘法(二)

第4课时

1.C 2.D 3.x≠-1

4.解:(1)原式=y^9÷y^6=y^3.

(2)原式=-x^9÷x^3+4x^6

=-x^6+4x^6

=3x^6.

5.D

6.解:(1)原式=48x^5y^2÷8xy=6x^4y.

(2)原式=-3a^6b^7c·1/2a=-3/2a^7b^7c.

7.解:(1)原式=15x^2y÷5xy-10xy^2÷5xy

=3x-2y.

(2)原式=[12x^3÷(-6x)]+[(-18x^2)÷(-6x)]

=-2x^2+3x-1.

14.2.1平方差公式

1.A

2.解:(1)原式=4x^2-25.

(2)原式=a^2-1-a^2+2a=2a-1.

(3)原式=123^2-(123+1)(123-1)

=123^2-123^2+1

=1.

14.2.2完全平方公式

第1课时

1.D

2.解:(1)原式=4m^2-12mn+9n^2.

(2)原式=16x^2+16xy+4y^2.

(3)原式=(200-1)^2=40 000-2×1×

200+1=39 601.

3.C

第2课时

1.C

2.解:(1)原式=[(x-2y)+1]^2

=(x-2y)^2+2(x-2y)+1

=x^2-4xy+4y^2+2x-4y+1.

(2)原式=[2x+(y+z)][2x-(y+z)]

=(2x)^2-(y+z)^2

=4x^2-(y^2+2yz+z^2)

=4x^2-y^2-2yz-z^2.

3~4版

一、选择题

1~5.BDBDA

6~10.BCDCC

二、填空题

11.-a^2 12.a+3b 13.-1

14.2 15.4或2或-2

三、解答题(一)

16.解:(1)原式=9x^4y^2÷(-9x^4y)

=[9÷(-9)]×(x^4÷x^4)×(y^2÷y)

=-y.

(2)原式=3a^2b^2÷ab+2a^2b÷ab

=3ab+2a.

17.解:(1)(x-2y)^2-(x-y)(x+y)

=x^2-4xy+4y^2-(x^2-y^2)

=x^2-4xy+4y^2-x^2+y^2

=5y^2-4xy.

(2)(-99.9)^2

=99.9^2

=(100-0.1)^2

=100^2-2×100×0.1+0.1^2

=10 000-20+0.01

=9 980.01.

18.解:原式=(x^2y^2-4-2x^2y^2+4)÷xy

=-x^2y^2÷xy

=-xy.

当x=1,y=-1/2时,

(2)原式=-18x^2+24x+54x-72

=-18x^2+78x-72.

18.解:原式=(2a-4)x^2+(a-6)x+m-3.

∴化简后不含x的二次项和常数项,

∴2a-4=0,m-3=0.

解得a=2,m=3.

四、解答题(二)

19.解:(1)根据题意,得

(2a+b)(3a+2b)-(2a)^2

=6a^2+4ab+3ab+2b^2-4a^2

=2a^2+7ab+2b^2.

答:广场内绿化带的总面积是(2a^2+7ab+2b^2)m^2.

(2)当a=10,b=5时,

2a^2+7ab+2b^2

=2×10^2+7×10×5+2×5^2

=600.

答:广场内绿化带的总面积是600 m^2.

20.解:(1)a^3+b^3.

(2)(a+b)(a^2-ab+b^2)

=a^3-a^2b+ab^2+ba^2-ab^2+b^3

=a^3+b^3.

(3)(x+y)(x^2-xy+y^2)-(x+2y)(x^2-2xy+

4y^2)

=x^3+y^3-(x^3+8y^3)

=-7y^3.

21.解:(1)①3,5;②±2.

(2)∴(4,5)=a,(4,6)=b,(4,30)=c,

∴4^a=5,4^b=6,4^c=30.

∴5×6=30,

∴4^a·4^b=4^c.

∴4^{a+b}=4^c.

∴a+b=c.

五、解答题(三)

22.解:(1)∴x^a=2,x^b=3,

∴x^{3a+2b}=x^{3a}·x^{2b}

=(x^a)^3·(x^b)^2

=2^3×3^2

=8×9

=72.

(2)2^{100}×8^{101}×(1/4)^{200}

=2^{100}×8^{100}×8×[(1/4)^2]^{100}

=8×16^{100}×(1/16)^{100}

=8×1

=8.

23.解:(1)2m-1.

(2)S_3与2(S_1+S_2)的差是常数.

∴正方形的边长

(m+1+m+7)×2+(m+2+m+4)×2

=4

=2m+7,

且S_1+S_2=2m^2+14m+15,

∴S_3-2(S_1+S_2)

=(2m+7)(2m+7)-2(2m^2+14m+15)

=4m^2+28m+49-4m^2-28m-30

=19.

∴S_3与2(S_1+S_2)的差是常数19.

(3)∴1≤n<2m-1,且正整数n有且只有1个,

∴n=1.

由题意,得1<2m-1≤2.

解得1<m≤3/2.

(2)DE=BD-CE.理由如下:

∴∠ABC和∠ACF的平分线相交于点O,

∴∠DBO=∠OBC,∠ECO=∠FCO.

∴DO∥BF,

∴∠DOB=∠OBC,∠EOC=∠FCO.

∴∠DOB=∠DBO,∠EOC=∠ECO.

∴BD=OD,OE=CE.

∴DE=OD-OE,

∴DE=BD-CE.

23.解:(1)设点M,N运动x s时,M,N两点重合.

根据题意,得x+12=2x.

解得x=12.

∴点M,N运动12 s时,M,N两点重合.

(2)设点M,N运动t秒时,可得到等边三角形AMN,如图①.

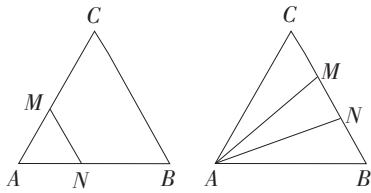
则AM=t,AN=AB-BN=12-2t.

∴△AMN是等边三角形,

∴t=12-2t.

解得t=4.

∴点M,N运动4 s时,可得到等边三角形AMN.



(第23题图)

(3)存在.由(1)知12 s时M,N两点重合,恰好在点C处,

如图②,假设△AMN是以MN为底边的等腰三角形,

∴AN=AM.

∴∠AMN=∠ANM.

∴∠AMC=∠ANB.

∴AB=BC=AC,

∴△ACB是等边三角形.

∴∠C=∠B.

在△ACM和△ABN中,

{ ∠AMC=∠ANB,

{ ∠C=∠B,

{ AC=AB,

∴△ACM≌△ABN(AAS).

∴CM=BN.

设当点M,N在BC边上,点M,N运动的时间为y s时,△AMN是

一、选择题

1~5.ACCAD 6~10.BBBDA

二、填空题

11.3 12.A 或 C

13.6 14.2 15.8

三、解答题(一)

16.(1)证明: $\because AD=BE$,

$\therefore AD+BD=BE+BD$, 即 $AB=DE$.

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

$$\begin{cases} AB=DE, \\ AC=DF, \\ BC=EF, \end{cases}$$

$\therefore \triangle ABC \cong \triangle DEF$ (SSS).

(2)解: 由(1), 知 $\triangle ABC \cong \triangle DEF$,

$\therefore \angle FDE = \angle A = 55^\circ$.

又 $\angle E = 45^\circ$,

$$\therefore \angle F = 180^\circ - (\angle FDE + \angle E) = 180^\circ - (55^\circ + 45^\circ) = 80^\circ.$$

17.证明: $\because D$ 是 AB 的中点,

$\therefore AD=BD$.

在 $\text{Rt}\triangle ADE$ 和 $\text{Rt}\triangle BDF$ 中,

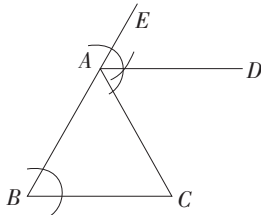
$$\begin{cases} AD=BD, \\ DE=DF, \end{cases}$$

$\therefore \text{Rt}\triangle ADE \cong \text{Rt}\triangle BDF$ (HL).

$\therefore \angle A = \angle B$.

$\therefore AC=BC$, 即 $\triangle ABC$ 是等腰三角形.

18.(1)解: 如图, 射线 AD 即为所求作.



(第 18 题图)

(2)证明: $\because AD \parallel BC$,

$\therefore \angle EAD = \angle B, \angle CAD = \angle C$.

又 $AB=AC$,

$\therefore \angle B = \angle C$.

$\therefore \angle EAD = \angle CAD$.

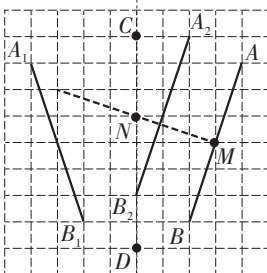
$\therefore AD$ 平分 $\angle CAE$.

四、解答题(二)

19.解: (1) 如图所示, 线段 A_1B_1 即为所求作;

(2) 如图所示, 线段 A_2B_2 即为所求作;

(3) 如图所示, 直线 MN 即为所求作.



(第 19 题图)

20.(1)证明: 连接 AE .

$\because EF$ 垂直平分 AB ,

$\therefore AE=BE$.

$\therefore BE=AC$,

$\therefore AE=AC$.

$\because D$ 是 CE 的中点,

$\therefore AD \perp BC$.

(2)解: 设 $\angle B = x^\circ$.

$\therefore AE=BE$,

$\therefore \angle BAE = \angle B = x^\circ$.

$\therefore \angle AEC = 2x^\circ$.

$\therefore AE=AC$,

$\therefore \angle C = \angle AEC = 2x^\circ$.

在 $\triangle ABC$ 中, $\angle B + \angle C + \angle BAC = 180^\circ$,

即 $3x^\circ + 75^\circ = 180^\circ$.

解得 $x = 35$.

$\therefore \angle B = 35^\circ$.

21.(1)证明: $\because \angle BAC = \angle DAE = 90^\circ$,

$\therefore \angle BAC - \angle CAD = \angle DAE - \angle CAD$,

即 $\angle BAD = \angle CAE$.

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

$$\begin{cases} AB=AC, \\ \angle BAD = \angle CAE, \\ AD=AE, \end{cases}$$

$\therefore \triangle ABD \cong \triangle ACE$ (SAS).

(2)解: $\because \triangle ABD \cong \triangle ACE$,

$\therefore \angle B = \angle ACE$.

$\because \triangle ABC$ 和 $\triangle ADE$ 都是等腰直角三角

形,

$\therefore \angle B = 45^\circ, \angle AED = 45^\circ$.

$\therefore \angle ACE = \angle B = 45^\circ$.

$\therefore \angle EAC = 60^\circ$,

$\therefore \angle AEC = 180^\circ - (\angle ACE + \angle EAC) =$

$180^\circ - (45^\circ + 60^\circ) = 75^\circ$.

$\therefore \angle CED = \angle AEC - \angle AED = 75^\circ - 45^\circ =$

30° .

五、解答题(三)

22.(1)证明: $\because \triangle ABC$ 为等边三角形,

$\therefore AB=BC, \angle ABC = \angle C = 60^\circ$.

在 $\triangle ABE$ 和 $\triangle BCD$ 中,

$$\begin{cases} AB=BC, \\ \angle ABE = \angle C, \\ BE=CD, \end{cases}$$

$\therefore \triangle ABE \cong \triangle BCD$ (SAS).

$\therefore \angle BAE = \angle CBD$.

$\therefore \angle AFD = \angle ABF + \angle BAF = \angle ABF +$

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

(2)解: 由(1), 得 $\triangle ABE \cong \triangle BCD$.

$\therefore \angle BAE = \angle CBD, AE=BD$.

$\therefore AH \perp BD, \angle AFH = 60^\circ$,

$\therefore \angle AHF = 90^\circ, \angle FAH = 30^\circ$.

$\therefore HF=8$.

$\therefore AF=2HF=16$.

$\therefore AE=AF+EF=16+2=18$.

$\therefore BD=AE=18$.

$\therefore BF=BD-FH-HD=18-8-3=7$.

23.解: (1) $= 30$.

(2) ① $AD=BE$.

理由: $\because \angle ACB = \angle DCE = 60^\circ$,

$\therefore \angle ACB + \angle BCD = \angle DCE + \angle BCD$,

即 $\angle ACD = \angle BCE$.

在 $\triangle ACD$ 和 $\triangle BCE$ 中,

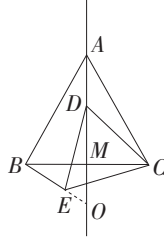
$$\begin{cases} AC=BC, \\ \angle ACD = \angle BCE, \\ CD=CE, \end{cases}$$

$\therefore \triangle ACD \cong \triangle BCE$ (SAS).

$\therefore AD=BE$.

② $\angle AOB$ 是定值, $\angle AOB = 60^\circ$.

当点 D 在线段 AM 上时, 如图, 延长 BE 交直线 AM 于点 O .



(第 23 题图)

由(1)知 $\triangle ACD \cong \triangle BCE$,

则 $\angle CBE = \angle CAD = 30^\circ$.

$\because \triangle ABC$ 是等边三角形, 线段 AM 为 BC 边上的中线,

$\therefore AM \perp BC$, 即 $\angle BMO = 90^\circ$.

$\therefore \angle AOB = 180^\circ - 90^\circ - 30^\circ = 60^\circ$.

当点 D 在线段 AM 的延长线上时, 如图②.

$\because \angle CAM = 30^\circ$, 点 D 在线段 AM 的延长线上,

$\therefore \angle CAD = 30^\circ$.

$\therefore \triangle ACD \cong \triangle BCE$,

$\therefore \angle CBE = \angle CAD = 30^\circ$.

$\because \triangle ABC$ 是等边三角形, 线段 AM 为 BC 边上的中线,

$\therefore AM \perp BC$.

$\therefore \angle OMB = 90^\circ$.

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

综上, $\angle AOB$ 是定值, $\angle AOB$ 的度数是 60° .

3~4 版

期中综合能力提升(二)

一、选择题

1~5.AABAC 6~10.CCBAB

二、填空题

11.(4, -2) 12.12 13.66 14. $\frac{8}{3}$

15. 130° 或 50° 或 40°

三、解答题(一)

16.证明: $\because BE \perp AC, CF \perp AB$,

$\therefore \angle DFB = \angle DEC = 90^\circ$.

在 $\triangle DFB$ 和 $\triangle DEC$ 中,

$$\begin{cases} \angle DFB = \angle DEC = 90^\circ, \\ \angle BDF = \angle CDE, \end{cases}$$

$BD=CD$,

$\therefore \triangle DFB \cong \triangle DEC$ (AAS).

$\therefore DF=DE$.

$\because BE \perp AC, CF \perp AB$,

$\therefore AD$ 平分 $\angle BAC$.

17.解: $\because \angle A + \angle ABC + \angle BCD + \angle D =$

$360^\circ, \angle A = 80^\circ, \angle D = 140^\circ$,

$\therefore \angle ABC + \angle BCD = 360^\circ - \angle A - \angle D =$

$360^\circ - 80^\circ - 140^\circ = 140^\circ$.

$\because BO$ 平分 $\angle ABC, CO$ 平分 $\angle BCD$,

$\therefore \angle OBC = \frac{1}{2} \angle ABC, \angle OCB = \frac{1}{2} \angle BCD$.

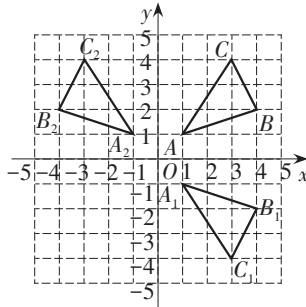
$\therefore \angle OBC + \angle OCB = \frac{1}{2} (\angle ABC + \angle BCD) =$

$\frac{1}{2} \times 140^\circ = 70^\circ$.

$\therefore \angle BOC = 180^\circ - (\angle OBC + \angle OCB) =$

$180^\circ - 70^\circ = 110^\circ$.

18.解: (1) 如图, $\triangle A_1B_1C_1$ 即为所求作, $A_1(1, -1), B_1(4, -2), C_1(3, -4)$.



(第 18 题图)

(2) 如图, $\triangle A_1B_1C_2$ 即为所求作.

四、解答题(二)

19.解: (1) 设这个多边形的边数是 n .

由题意, 得 $(n-2) \times 180^\circ = 360^\circ \times 3$.

解得 $n=8$.

所以这个多边形是八边形.

(2) 设这个多边形的边数是 m , 重复加的角的度数是 x° .

由题意, 得 $(m-2) \times 180^\circ + x^\circ = 1\ 280^\circ$.

$\therefore (m-2) \times 180^\circ = 1\ 280^\circ - x^\circ$.

$\therefore 1\ 280^\circ \div 180^\circ = 7 \cdots 20^\circ$,

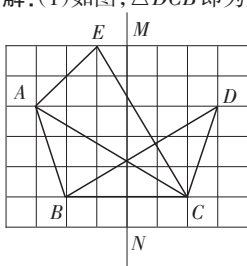
$\therefore x=20$.

$\therefore (m-2) \times 180^\circ = 1\ 260^\circ$.

解得 $m=9$.

所以这个多边形的边数是 9, 重复加的那个角的度数是 20° .

20.解: (1) 如图, $\triangle DCB$ 即为所求作.



(第 20 题图)

(2) $S_{\triangle ACE} = 5 \times 5 - \frac{1}{2} \times 2 \times 2 - \frac{1}{2} \times 3 \times 5 - \frac{1}{2} \times 3 \times 5 = 8$.

21.解: (1) 证明: $\because AB=AC$,

$\therefore \angle B = \angle C$.

$\because P$ 为 BC 的中点,

$\therefore BP=CP$.

在 $\triangle BDP$ 和 $\triangle CEP$ 中,

$$\begin{cases} \angle BDP = \angle CEP, \\ \angle B = \angle C, \\ BP = CP, \end{cases}$$

$\therefore \triangle BDP \cong \triangle CEP$ (AAS).

(2) $\because \angle A = 110^\circ, AB=AC$,

$\therefore \angle B = \angle C = 35^\circ$.

$\because PD \perp AB$,

$\therefore \angle PDB = 90^\circ$.

由(1), 得 $\triangle BDP \cong \triangle CEP$.

$\therefore \angle PEC = \angle PDB = 90^\circ$.

$\therefore \angle EPC = 180^\circ - \angle PEC - \angle C = 180^\circ - 90^\circ - 35^\circ = 55^\circ$.

五、解答题(三)

22.证明: (1) $\because AB \perp AD, AC \perp AE$,

$\therefore \angle BAD = \angle CAE = 90^\circ$.

$\therefore \angle BAD + \angle BAC = \angle CAE + \angle BAC$,

即 $\angle DAC = \angle BAE$.

在 $\triangle DAC$ 和 $\triangle BAE$ 中,

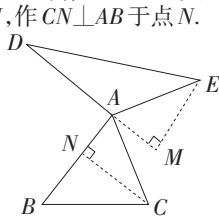
$\begin{cases} AD=AB, \\ \angle DAC = \angle BAE, \end{cases}$

$AC=AE$,

$\therefore \triangle DAC \cong \triangle BAE$ (SAS).

$\therefore DC=BE$.

(2) 如图, 作 $EM \perp DA$ 交 DA 的延长线于点 M , 作 $CN \perp AB$ 于点 N .



(第 22 题图)

$\therefore \angle EMD = \angle CNA = 90^\circ$.

$\therefore \angle MAN = 180^\circ - \angle DAB = 90^\circ = \angle CAE$,

$\therefore \angle MAN - \angle CAM = \angle CAE - \angle CAM$,

即 $\angle CAN = \angle MAE$.

在 $\triangle ACN$ 和 $\triangle AEM$ 中,

$$\begin{cases} \angle ANC = \angle AME, \\ \angle CAN = \angle EAM, \\ AC=AE, \end{cases}$$

$\therefore \triangle ACN \cong \triangle AEM$ (AAS).

$\therefore CN=EM$.

$\because AB=AD, \therefore \frac{1}{2} AB \cdot CN = \frac{1}{2} AD \cdot EM$.

$\therefore S_{\triangle ABC} = S_{\triangle ADE}$.

23.解: (1) 证明: $\because \triangle ABD$ 和 $\triangle ACE$ 是等边三角形,

$\therefore AB=AD, AC=AE, \angle DAB = \angle EAC = 60^\circ$.

$\therefore \angle DAB + \angle BAC = \angle EAC + \angle BAC$,

即 $\angle DAC = \angle BAE$.

$\therefore \triangle ABE \cong \triangle ADC$.

(2) $\angle BOC = 90^\circ$. 理由如下:

\because 四边形 $ABFD$ 和四边形 $ACGE$ 都是正方形,

$\therefore AB=AD, AC=AE, \angle DAB = \angle EAC =$

90° .

$\therefore \angle DAB + \angle DAE = \angle EAC + \angle DAE$,

即 $\angle BAE = \angle DAC$.

$\therefore \triangle ABE \cong \triangle ADC$.

$\therefore \angle BEA = \angle DCA$.

如图②, 设 AE, CD 相交于点 M .

在 $\triangle MOE$ 和 $\triangle MAC$ 中,

$\therefore \angle BEA = \angle DCA, \angle EMO = \angle AMC$,

$\therefore \angle EOC = \angle EAC = 90^\circ$.

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