第 11 期

2 版

14.1.1 同底数幂的乘法

1.21

2.(1)$(a-b)^5$;(2)a^{2m+3}.

3.16

14.1.2 幂的乘方

1.A

2.(1)x^{38};(2)$2a^{12}$.

3.C

14.1.3 积的乘方

1.D　2.1

3.解:(1)原式$=16x^8-x^8=15x^8$.

(2)原式$=-8x^6+9x^6+x^6=2x^6$.

4.64

14.1.4 整式的乘法(一)

第 1 课时

1.C

2.(1)$\frac{1}{3}a^3b^4c$;(2)$-40x^4$;(3)$2x^4y^6$.

3.1,2

第 2 课时

1.B

2.解:(1)原式$=2a^3b^2-6a^2b^2$.

(2)原式$=-8x^3y^3+2x^2y^2+8x^3y^3=2x^2y^2$.

3.C

第 3 课时

1.D

2.解:(1)原式$=x^2+2x+x+2=x^2+3x+2$.

(2)原式$=x^2-xy+xy-y^2-2x+2y$

$=x^2-y^2-2x+2y$.

3.3

3 版

一、选择题

1~3.CBB　4~6.BCD

二、填空题

7.12^5　8.6

9.2 024　10.2

11.3　12.-1

三、解答题

13.解:(1)原式$=-a^8\cdot a^6=-a^{14}$.

(2)原式$=m^8+m^8-m^8=m^8$.

14.解:(1)$2(2x^2-xy)+x(x-y)$

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

$=5x^2-3xy$.

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

$=2a^2b^3-a^3b^2-4a^2b^3+a^3b^2$

$=-2a^2b^3$.

15.解:(1)由题意,得$(3a-b)(3a+b)-(a+b)(a+b)=9a^2+3ab-3ab-b^2-(a^2+ab+ab+b^2)=8a^2-2ab-2b^2$.

答:长方形试验田比正方形试验田多种植豌豆幼苗$(8a^2-2ab-2b^2)$株.

(2)当$a=4$,$b=3$时,

原式$=8\times4^2-2\times4\times3-2\times3^2=128-24-18=86$.

答:长方形试验田比正方形试验田多种植 86 株豌豆幼苗.

16.解:(1)$\because 2\times4^x\times32^x=8^{12}$,

$\therefore 2\times2^{2x}\times2^{5x}=2^{36}$,

即$2^{1+7x}=2^{36}$.

$\therefore 1+7x=36$.

解得$x=5$.

(2)$\because 5^{x+2}+5^{x+1}=750$,

$\therefore 5\times5^{x+1}+5^{x+1}=6\times125$.

$\therefore 6\times5^{x+1}=6\times5^3$,

即$5^{x+1}=5^3$.

$\therefore x+1=3$.

解得$x=2$.

17.解:(1)$S_1-S_2=(m+7)(m+1)-(m+4)(m+2)=2m-1$.

故答案为:$2m-1$.

(2)S_3与$2(S_1+S_2)$的差是常数.

∵正方形的边长

$=\frac{(m+1+m+7)\times2+(m+2+m+4)\times2}{4}$

$=2m+7$,

且$S_1+S_2=2m^2+14m+15$,

$\therefore S_3-2(S_1+S_2)=(2m+7)(2m+7)-2(2m^2+14m+15)=4m^2+28m+49-4m^2-28m-30=19$.

$\therefore S_3$与$2(S_1+S_2)$的差是常数 19.

(3)$\because 1\leqslant n<2m-1$,且正整数$n$有且只有 1 个,

$\therefore n=1$.

由题意,得$1<2m-1\leqslant2$.

解得$1<m\leqslant\frac{3}{2}$.

第 12 期

2 版

14.1.4 整式的乘法(二)

第 4 课时

1.B

2.$\frac{9}{16}$

3.解:(1)原式$=y^9\div y^6=y^3$.

(2)原式$=a^6+a^6-a^6=a^6$.

4.A

5.解:(1)原式$=48x^3y^2\div8xy=6x^2y$.

(2)原式$=-3a^6b^7c\cdot\frac{1}{2}a=-\frac{3}{2}a^7b^7c$.

6.解:(1)原式$=15x^2y\div5xy-10xy^2\div5xy$

$=3x-2y$.

(2)原式$=b^2-2ab+4a^2-2ab$

$=b^2-4ab+4a^2$.

7.D

14.2.1 平方差公式

1.B

2.解:(1)原式$=4x^2-25$.

(2)原式$=a^2-1-a^2+2a=2a-1$.

3.C

14.2.2 完全平方公式

第 1 课时

1.C

2.解:(1)原式$=4m^2-12mn+9n^2$.

(2)原式$=16x^2+16xy+4y^2$.

(3)原式$=(200-1)^2=40 000-2\times1\times200+1=39 601$.

3.D

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 版

一、选择题

1~3.CDD　4~6.DBC

二、填空题

7.a^2　8.-3

9.-1　10.7 或-5

11.$3x^4-9x^3$

12.$(a-b)^2=(a+b)^2-4ab$;2

三、解答题

13.解:(1)原式$=9x^4y^2\div(-9x^4y)$

$=[9\div(-9)]\cdot(x^4\div x^4)\cdot(y^2\div y)$

$=-y$.

(2)原式$=3a^2b^2\div ab+2a^2b\div ab$

$=3ab+2a$.

14.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)$1 001\times999-997^2$

$=(1 000+1)\times(1 000-1)-(1 000-3)^2$

$=1 000^2-1-1 000^2+6 000-9$

$=6 000-10$

$=5 990$.

15.解:$\because(x+3)(x-3)+x(x-2)$

$=x^2-9+x^2-2x$

$=2x^2-2x-9$

$=2(x^2-x)-9$.

$\because x^2-x-1=0$,

$\therefore x^2-x=1$.

∴原式$=2\times1-9$

$=2-9$

$=-7$.

∴式子$(x+3)(x-3)+x(x-2)$的值是-7.

16.解:(1)$(a+b)(a-b)$,a^2-b^2.

(2)$(a+b)(a-b)=a^2-b^2$.

①$(2+1)(2^2+1)(2^4+1)(2^8+1)$

$=(2-1)(2+1)(2^2+1)(2^4+1)(2^8+1)$

$=(2^2-1)(2^2+1)(2^4+1)(2^8+1)$

$=(2^4-1)(2^4+1)(2^8+1)$

$=(2^8-1)(2^8+1)$

$=2^{16}-1$.

②$(3+1)(3^2+1)(3^4+1)(3^8+1)$

$=\frac{1}{2}(3-1)(3+1)(3^2+1)(3^4+1)(3^8+1)$

$=\frac{1}{2}(3^2-1)(3^2+1)(3^4+1)(3^8+1)$

$=\frac{1}{2}(3^4-1)(3^4+1)(3^8+1)$

$=\frac{1}{2}(3^8-1)(3^8+1)$

$=\frac{3^{16}-1}{2}$.

17.解:(1)$(a+b)^2=(a-b)^2+4ab$.

(2)由(1)题结论$(a+b)^2=(a-b)^2+4ab$,可得$(a-b)^2=(a+b)^2-4ab$.

当$x+y=5$,$xy=\frac{9}{4}$时,

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

$=25-9=16$.

(3)-1,-3.

第 9 期

2~3 版

一、选择题

1~3.BDA　4~6.ABC

二、填空题

7.52°

8.答案不唯一,如∠B=60°

9.-1

10.54

11.3

12.40°或 100°或 140°

三、

13.解:∵$AB=BD$,

∴∠BAD=∠BDA.

∵∠B=50°,

∴∠BAD=∠BDA=65°.

∵∠BDA=∠DAC+∠C,∠C=36°,

∴∠DAC=∠BDA-∠C=65°-36°=29°.

14.解:根据题意,可得$AB=20\times2=40$(海里).

∵∠NAC=40°,∠NBC=80°,

∴∠ACB=∠NBC-∠NAC=80°-40°=40°.

∴∠ACB=∠NAC.

∴$BC=BA=40$(海里).

答:从B处到灯塔C的距离为 40 海里.

15.解:(1)∵$AB\parallel CD$,

∴∠ACD+∠CAB=180°.

∴∠CAB=50°.

∵AD平分∠CAB,

∴∠$DAB=\frac{1}{2}$∠CAB=25°.

(2)证明:∵∠CAD=∠D,

∴$CA=CD$.

∵$CE\perp AD$,

∴$AE=DE$.

16.解:∵点P关于OA的对称点是P_1,点P关于OB的对称点是P_2,

∴OA垂直平分PP_1,OB垂直平分PP_2.

∴$PM=P_1M$,$PN=P_2N$.

∴∠PMN=2∠P_1,∠PNM=2∠P_2.

∵$PP_1\perp OA$,$PP_2\perp OB$,

∴∠P_2PP_1=180°-∠AOB=139°.

∴∠P_1+∠P_2=41°.

∴∠MPN=180°-2×41°=98°.

∴∠MPN的度数 98°.

17.解:(1)∵AB边的垂直平分线分别交AB,BC于点D,E,

∴$BE=AE$.∴∠BAE=∠B=30°.

又∵∠BAC=80°,

∴∠CAE=∠BAC-∠BAE=80°-30°=50°.

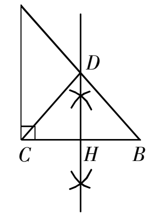
(2)由(1)知$AE=BE$,

∴$AE+CE+AC=BE+CE+AC=BC+AC=12$cm.

∴△AEC的周长为 12cm.

四、

18.解:(1)如图,DH为所作.



(第 18 题图)

(2)∵DH垂直平分BC,

∴$DC=DB$.

∴∠B=∠DCB.

∵∠B+∠A=90°,∠DCB+∠DCA=90°,

∴∠A=∠DCA.

∴$DC=DA$.

∴△BCD的周长$=DC+DB+BC=DA+DB+BC=AB+BC=8+5=13$.

19.解:(1)证明:∵BD是△ABC的角平分线,

∴∠CBD=∠EBD.

∵$DE\parallel BC$,∴∠CBD=∠EDB.

∴∠EBD=∠EDB.

(2)$CD=ED$.理由如下:

∵$AB=AC$,∴∠C=∠ABC.

∵$DE\parallel BC$,

∴∠ADE=∠C,∠AED=∠ABC.

∴∠ADE=∠AED.∴$AD=AE$.

∴$CD=BE$.

由(1),得∠EBD=∠EDB.

∴$BE=DE$.∴$CD=ED$.

20.解:(1)$3t$cm;$(10-2t)$cm.

(2)当点P在AB边上运动时,

∵△ABC是等边三角形,

∴∠A=∠C=∠B=60°.

当$PQ\parallel AC$时,∠BQP=∠C=60°,∠BPQ=∠A=60°,

∴△BQP是等边三角形.

∴$BQ=BP$,

即$10-2t=3t$.

解得$t=2$.

当点P在BC边上时,

同理可得$10-(3t-20)=2t-10$.

解得$t=8$.

综上所述,当$PQ\parallel AC$时,t的值为 2 或 8.

五、

21.解:(1)如图,△$A_1B_1C_1$即为所求.点B_1的坐标为$(-3,2)$.

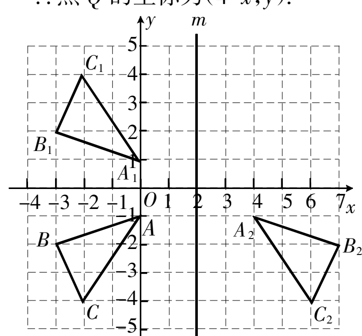
(2)如图,△$A_2B_2C_2$即为所求.

设点$P(x,y)$在△$A_2B_2C_2$内部对应点Q的坐标为(a,b).

由题意,得$a-2=2-x$,$b=y$.

∴$a=4-x$,$b=y$.

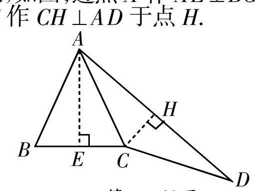
∴点Q的坐标为$(4-x,y)$.



(第 21 题图)

22.解:(1)$\frac{1}{2}\alpha$.

(2)如图,过点A作$AE\perp BC$于点E,过点C作$CH\perp AD$于点H.



(第 22 题图)

∵$AB=AC$,$AC=CD$,

∴∠$EAC=\frac{1}{2}$∠BAC,∠$ACH=\frac{1}{2}$∠ACD,$CE=\frac{1}{2}BC$.

∴∠EAC+∠$ACH=\frac{1}{2}$(∠BAC+∠ACD).

∵∠ACD与∠BAC互补,

∴∠EAC+∠$ACH=\frac{1}{2}$×180°=90°.

∵∠EAC+∠ACE=90°,

∴∠ACE=∠ACH.

∵∠AHC=∠AEC=90°,$AC=AC$,

∴△ACH≌△ACE(AAS).

∴$CH=CE=\frac{1}{2}BC$.

(3)∠ACD=∠BAC或∠ACD与∠BAC互补.

六、

23.解:(1)$AF=BD$.

(2)结论仍然成立.

证明:∵△ABC和△DCF都是等边三角形,

∴$AC=BC$,$CD=CF$,∠ACB=∠DCF=60°.

∴∠ACB+∠ACD=∠DCF+∠ACD,

即∠BCD=∠ACF.

在△BCD和△ACF中,

$\begin{cases}BC=AC,\\ \angle BCD=\angle ACF,\\ CD=CF,\end{cases}$

∴△BCD≌△ACF(SAS).

∴$AF=BD$.

(3)$AF+BF'=AB$.

证明:由(1)知,△BCD≌△ACF.

∴$BD=AF$.

同理可证,△BCF'≌△ACD(SAS).

∴$BF'=AD$.

∴$AF+BF'=BD+AD=AB$.

第 10 期

1~2 版

期中综合能力提升(一)

一、选择题

1~3.DCB　4~6.ADB

二、填空题

7.5　8.15

9.-3　10.43°

11.2

12.$2\alpha+\beta=50°$或$2\alpha-\beta=50°$或$\beta-2\alpha=50°$

三、

13.解:(1)∵$|a-1|+(b-3)^2=0$,

且$|a-1|\geqslant0$,$(b-3)^2\geqslant0$,

∴$a-1=0$,$b-3=0$.

∴$a=1$,$b=3$.

∴$2<c<4$.

(2)证明:∵∠AED=∠ABC,∠AED=∠ABE+∠EAB,∠ABC=∠ABE+∠DBC,

∴∠EAB=∠DBC.

∵$AE=BE$,∴∠EAB=∠ABE.

∴∠DBC=∠ABE.∴BD平分∠ABC.

14.解:∵∠$CAB=\frac{1}{5}\times(5-2)\times180°=108°$,

∠$DAB=\frac{1}{8}\times(8-2)\times180°=135°$,

∴∠CAD=360°-(∠CAB+∠DAB)=117°.

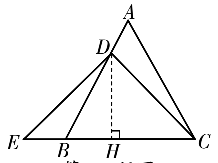
∵$AC=AD$,

③

$\therefore \angle ACD=\frac{1}{2}\times(180°-\angle CAD)=31.5°$.

15.**解**:$\because AB\perp BC, A'B'\perp B'C'$,
$\therefore \angle ABC=\angle A'B'C'=90°$.
$\because AC/\!/A'C'$,
$\therefore \angle ACB=\angle A'C'B'$.
在$\triangle ABC$和$\triangle A'B'C'$中,
$\begin{cases}\angle ACB=\angle A'C'B',\\ \angle ABC=\angle A'B'C',\\ AB=A'B',\end{cases}$
$\therefore \triangle ABC\cong\triangle A'B'C'$(AAS).
$\therefore BC=B'C'$,
即影子一样长.

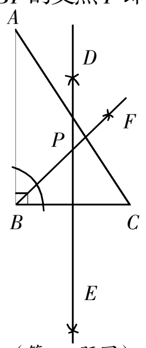
16.**解**:(1)证明:$\because \triangle ABC$是等边三角形,
$\therefore \angle ABC=\angle ACB=60°$.
$\because \angle E+\angle EDB=\angle ABC=60°$, $\angle ACD+\angle DCB=60°$, $\angle EDB=\angle ACD$,
$\therefore \angle E=\angle DCE$.
$\therefore DE=DC$.
$\therefore \triangle DEC$是等腰三角形.
(2)设$\angle EDB=\alpha$,则$\angle BDC=5\alpha$.
$\therefore \angle E=\angle DCE=60°-\alpha$.
$\therefore 6\alpha+60°-\alpha+60°-\alpha=180°$.
$\therefore \alpha=15°$.
$\therefore \angle E=\angle DCE=45°$.
$\therefore \angle EDC=90°$.
如图,过点D作$DH\perp CE$于点H.



(第16题图)

$\because \triangle DEC$是等腰直角三角形,
$\therefore \angle EDH=\angle E=45°$.
$\therefore EH=HC=DH=\frac{1}{2}EC=\frac{1}{2}\times 8=4$.
$\therefore \triangle EDC$的面积$=\frac{1}{2}\times EC\cdot DH=\frac{1}{2}\times 8\times 4=16$.

17.**解**:如图,先作出线段BC的垂直平分线DE,再作出$\angle ABC$的平分线BF.则DE与BF的交点P即为所求.



(第17题图)

四、

18.**解**:(1)$\because AD\perp BC, BD=DE$,
$\therefore AD$是BE的垂直平分线.
$\therefore AB=AE$.
$\because EF$垂直平分AC,
$\therefore AB=AE=EC$.
$\therefore \angle C=\angle CAE$.
$\because \angle BAE=40°$,
$\therefore \angle DAE=\frac{1}{2}\angle BAE=20°$.
$\therefore \angle AED=70°$.
$\therefore \angle C=\frac{1}{2}\angle AED=35°$.
(2)$\because \triangle ABC$的周长为13cm,$AC=6$cm,
$\therefore AB+BE+EC=7$cm,即$2DE+2EC=7$cm.
$\therefore DC=DE+EC=3.5$cm.

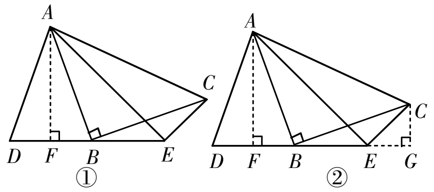
19.**解**:(1)证明:$\because CM=BM, \angle B=40°$,
$\therefore \angle MCB=\angle B=40°$, $\angle CME=\angle B+\angle MCB=80°$.
$\because \angle ACB=90°, \angle B=40°$,
$\therefore \angle A=90°-\angle B=50°$.
$\because \angle ACE=30°$,
$\therefore \angle CEM=\angle A+\angle ACE=50°+30°=80°$.
$\therefore \angle CME=\angle CEM$.
$\therefore CE=CM$.
(2)由(1)和题意知$CE=CM=2$.
$\because EF\perp AC, \angle ACE=30°$,
$\therefore EF=\frac{1}{2}CE=1$.

20.**解**:(1)证明:$\because \angle BAC=\angle DAE=90°$,
$\therefore \angle BAC-\angle CAD=\angle DAE-\angle CAD$,
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)$\because \triangle ABD\cong\triangle ACE$,
$\therefore \angle B=\angle ACE$.
$\because \triangle ABC$和$\triangle ADE$都是等腰直角三角形,
$\therefore \angle B=45°, \angle AED=45°$.
$\therefore \angle ACE=\angle B=45°$.
$\because \angle EAC=60°$,
$\therefore \angle AEC=180°-(\angle ACE+\angle EAC)=180°-(45°+60°)=75°$.
$\therefore \angle CED=\angle AEC-\angle AED=75°-45°=30°$.

五、

21.**解**:(1)$\because DE=DF=BD$,
$\therefore \angle DBE=\angle E, \angle DBF=\angle F$.
$\because \triangle ABC$是等边三角形,
$\therefore \angle ABC=60°$.
$\therefore \angle E+\angle F=\angle DBE+\angle DBF=60°$.
(2)证明:$\because \triangle ABC$是等边三角形,
$\therefore \angle BAC=\angle ACB=60°$.
$\therefore \angle EAD=\angle DCF$, $\angle E+\angle ADE=\angle BAC=60°$.
由(1)知,$\angle E+\angle F=60°$,
$\therefore \angle F=\angle ADE$.
又$\because DE=DF$,
$\therefore \triangle ADE\cong\triangle CFD$(AAS).
$\therefore AE=CD, AD=CF$.
$\therefore AC=AD+CD=CF+AE$.

22.**解**:(1)证明:$\because \angle ABC=90°, AB=BC$, $\therefore \angle BAC=45°$.
如图①,过点A作$AF\perp BD$于点F.
$\because AB=AD$, $\therefore \angle BAF=\frac{1}{2}\angle BAD$.
$\because \angle CAE=\frac{1}{2}\angle BAD$,
$\therefore \angle BAF=\angle CAE$.
$\therefore \angle BAF+\angle BAE=\angle CAE+\angle BAE=\angle BAC=45°$,即$\angle EAF=45°$.
在$Rt\triangle AEF$中,$\angle AEB=90°-\angle EAF=45°$.



(第22题图)

(2)证明:如图②,过点C作$CG\perp DE$于点G,则$\angle AFB=\angle BGC=90°$.
$\because \angle BAF+\angle ABF=90°, \angle CBG+\angle ABF=90°$,
$\therefore \angle BAF=\angle CBG$.
又$\because AB=BC$,
$\therefore \triangle ABF\cong\triangle BCG$(AAS).
$\therefore AF=BG, FB=CG$.
由(1)可知$\angle EAF=\angle AEB=45°$.
$\therefore AF=EF=BG$. $\therefore FB=EG=CG$.
$\therefore \angle CEG=45°$.
$\therefore \angle AEC=180°-(\angle AEB+\angle CEG)=90°$.
(3)$\because AF-CG=BG-EG=BE=4$,
$\therefore S_{\triangle ABE}-S_{\triangle CBE}=\frac{1}{2}BE\cdot AF-\frac{1}{2}BE\cdot CG=\frac{1}{2}BE\cdot(AF-CG)=\frac{1}{2}BE^2=\frac{1}{2}\times 4^2=8$.

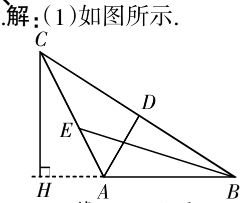
六、

23.**解**:(1)证明:$\because \triangle ABD$和$\triangle ACE$是等边三角形,
$\therefore AB=AD, AC=AE, \angle DAB=\angle EAC=60°$.
$\therefore \angle DAB+\angle BAC=\angle EAC+\angle BAC$,
即$\angle DAC=\angle BAE$.
$\therefore \triangle ABE\cong\triangle ADC$.
(2)$\angle BOC=90°$.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$\angle BAE=\angle DAC$.
$\therefore \triangle ADC\cong\triangle ABE$.
$\therefore \angle BEA=\angle DCA$.
如图②,设AE, CD相交于点M.
在$\triangle MOE$和$\triangle MAC$中,
$\because \angle BEA=\angle DCA, \angle EMO=\angle AMC$,
$\therefore \angle EOC=\angle EAC=90°$.
$\therefore \angle BOC=180°-\angle EOC=90°$.
(3)如图③,设AE, CD交于点M.
同理,得$\triangle ADC\cong\triangle ABE$.
$\therefore \angle BEM=\angle DCA$.
$\because$五边形$ACIGE$是正五边形,
$\therefore \angle MAC=180°-\frac{360°}{5}=108°$.
$\therefore \angle BOC=\angle BEM+\angle OME=\angle DCA+\angle AMC=180°-\angle MAC=72°$.
(4)$\frac{360°}{n}$.
提示:如图④,同理,得$\triangle ADC\cong\triangle ABE$.
$\therefore \angle BEM=\angle DCA$.
$\because n$边形$AC\cdots E$是正n边形,
$\therefore \angle MAC=180°-\frac{360°}{n}$.
$\therefore \angle BOC=\angle BEM+\angle OME=\angle DCA+\angle AMC=180°-\angle MAC=180°-\left(180°-\frac{360°}{n}\right)=\frac{360°}{n}$.

3~4版

期中综合能力提升(二)

一、选择题
1~3.BCD　　4~6.BDA
二、填空题
7.(−2,1)　　8.12
9.66　　10.$2a+3b$
11.125°
12.130°或50°或40°
三、
13.**解**:(1)如图所示.



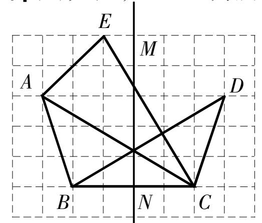
(第13(1)题图)

(2)根据题意,得$\begin{cases}3a-b=9,\\ 4+3b=-5.\end{cases}$
解得$a=2, b=-3$.

14.**解**:连接MA.
$\because MN$垂直平分AB,
$\therefore MA=MB=12, \angle B=\angle MAB$.
$\therefore \angle AMC=\angle B+\angle MAB=2\angle B=2\times 15°=30°$.
$\because \angle C=90°$,
$\therefore AC=\frac{1}{2}AM=6$(cm).

15.**证明**:$\because \angle OBD=\angle ODB$,
$\therefore OB=OD$.
在$\triangle ABO$和$\triangle CDO$中,
$\begin{cases}OA=OC,\\ \angle AOB=\angle COD,\\ OB=OD,\end{cases}$
$\therefore \triangle ABO\cong\triangle CDO$(SAS).
$\therefore AB=CD$.

16.**解**:(1)如图,$\triangle DBC$为所作.



(第16题图)

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

17.**解**:(1)证明:$\because \angle CAF=\angle BAE$,
$\therefore \angle BAC=\angle EAF$.
$\because$将线段AC绕A点旋转到AF的位置,
$\therefore AC=AF$.
在$\triangle ABC$与$\triangle AEF$中,
$\begin{cases}AB=AE,\\ \angle BAC=\angle EAF,\\ AC=AF,\end{cases}$
$\therefore \triangle ABC\cong\triangle AEF$(SAS).
$\therefore EF=BC$.
(2)$\because AB=AE, \angle ABC=65°$,
$\therefore \angle BAE=180°-65°\times 2=50°$.
$\therefore \angle FAG=\angle BAE=50°$.
$\because \triangle ABC\cong\triangle AEF$,
$\therefore \angle F=\angle C=28°$.
$\therefore \angle FGC=\angle FAG+\angle F=50°+28°=78°$.

四、

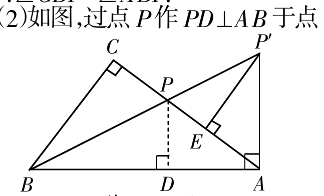
18.**解**:(1)设这个多边形的边数是n.
由题意,得$(n-2)\times 180°=360°\times 3$.
解得$n=8$.
答:这个多边形是八边形.
(2)设这个多边形的边数是m,重复加的角的度数是$x°$.
由题意,得$(m-2)\times 180°+x°=1\,280°$.
$\therefore (m-2)\times 180°=1\,280°-x°$.
$\because 1\,280°\div 180°=7\cdots\cdots 20°$,
$\therefore x=20$.
$(m-2)\times 180°=1\,260°$.
解得$m=9$.
答:这个多边形的边数是9,重复加的角的度数是20°.

19.**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)$\because \angle A=110°, AB=AC$,
$\therefore \angle B=\angle C=35°$.
$\because PD\perp AB$,
$\therefore \angle PDB=90°$.
由(1),得$\triangle BDP\cong\triangle CEP$.
$\therefore \angle PEC=\angle PDB=90°$.
在$\triangle EPC$中,$\angle EPC=90°-\angle C=90°-35°=55°$.

20.**证明**:在$\triangle ABC$中,$\angle ACB=180°-(\angle ABC+\angle BAC)=120°$.
$\because \triangle ACD$由$\triangle ACB$沿直线AC翻折得到,
$\therefore AD=AB, \angle ACD=\angle ACB=120°, \angle DAC=\angle BAC=15°$.
$\because \angle DAE=\angle DAC$,
$\therefore \angle CAE=2\angle DAC=30°$.
在$\triangle CAE$中,$\angle CEA=180°-(\angle ACE+\angle CAE)=30°$.
$\therefore \angle CEA=\angle CAE$.
$\therefore CA=CE$.
$\because \angle BCE=360°-(\angle ACB+\angle ACD)=120°$,
$\therefore \angle BCE=\angle BCA=120°$.
又$\because BC=BC$,
$\therefore \triangle BCE\cong\triangle BCA$(SAS).
$\therefore BE=AB$.
$\therefore BE=AD$.

五、

21.**证明**:(1)$\because AP=AP'$,
$\therefore \angle APP'=\angle AP'P$.
又$\because \angle BPC=\angle APP'$,
$\therefore \angle BPC=\angle AP'P$.
$\because \angle C=90°, AP'\perp AB$,
$\therefore \angle CBP+\angle BPC=90°, \angle ABP+\angle AP'P=90°$.
$\therefore \angle CBP=\angle ABP$.
(2)如图,过点P作$PD\perp AB$于点D.



(第21题图)

$\because \angle CBP=\angle ABP, PC\perp BC, PD\perp AB$,
$\therefore CP=DP$.
$\because P'E\perp AC$,
$\therefore \angle EAP'+\angle AP'E=90°$.
又$\because \angle PAD+\angle EAP'=90°$,
$\therefore \angle PAD=\angle AP'E$.
在$\triangle APD$和$\triangle P'AE$中,
$\begin{cases}\angle PAD=\angle AP'E,\\ \angle ADP=\angle P'EA=90°,\\ AP=AP',\end{cases}$
$\therefore \triangle APD\cong\triangle P'AE$(AAS).
$\therefore AE=DP$.
$\therefore AE=CP$.

22.**解**:(1)$\because \angle B=40°, \angle C=62°$,
$\therefore \angle BAC=180°-\angle B-\angle C=180°-40°-62°=78°$.
$\because AD$是$\angle BAC$的平分线,
$\therefore \angle DAC=\frac{1}{2}\angle BAC=39°$.
在$Rt\triangle AEC$中,$\because \angle EAC=90°-\angle C=90°-62°=28°$,
$\therefore \angle DAE=\angle DAC-\angle EAC=39°-28°=11°$.
(2)$\because \angle BAC=180°-\angle B-\angle C$, AD是$\angle BAC$的平分线,
$\therefore \angle DAC=\frac{1}{2}\angle BAC=90°-\frac{1}{2}(\angle B+\angle C)$.
$\because AE$是BC边上的高,
$\therefore$在$Rt\triangle AEC$中,$\angle EAC=90°-\angle C$.
$\therefore \angle DAE=\angle DAC-\angle EAC=90°-\frac{1}{2}(\angle B+\angle C)-(90°-\angle C)=\frac{1}{2}(\angle C-\angle B)$.
(3)设$\angle ACB=\alpha$.
$\because AE\perp BC$,
$\therefore \angle EAC=90°-\alpha, \angle BCF=180°-\alpha$.
$\because \angle CAE$和$\angle BCF$的平分线交于点G,
$\therefore \angle CAG=\frac{1}{2}\angle CAE=\frac{1}{2}(90°-\alpha)=45°-\frac{1}{2}\alpha$, $\angle BCG=\frac{1}{2}\angle BCF=\frac{1}{2}(180°-\alpha)=90°-\frac{1}{2}\alpha$.
$\therefore \angle G=180°-\angle CAG-\angle ACG=180°-\left(45°-\frac{1}{2}\alpha\right)-\alpha-\left(90°-\frac{1}{2}\alpha\right)=45°$.

六、

23.**证明**:(1)$\because DH=BD, AD\perp BC$,
$\therefore AB=AH, \angle ABH=\angle AHB$.
$\because \angle B=2\angle C$,
$\therefore \angle AHB=2\angle C$.
$\because \angle AHB=\angle C+\angle HAC$,
$\therefore \angle HAC=\angle C$.
$\therefore AH=HC$.
$\therefore AB=HC$.
$\therefore BC=HC+BH=AB+2BD$.
(2)$BE=2AD$.理由如下:延长DA至F,使$AF=AD$,连接BF.
设$\angle ABD=\angle BCE=x, \angle ABC=\angle DCE=y$.
$\because AF=AD, \angle BAC=90°$,
$\therefore AB$垂直平分DF.
$\therefore BF=BD$.
$\therefore \angle FBA=\angle DBA=x$, $\angle FBC=\angle FBA+\angle ABC=x+y$, $\angle ACB=\angle DCE+\angle BCE=x+y$.
$\therefore \angle FBC=\angle ACB$.
$\therefore BF=CF$.
$\because BF=BD$,
$\therefore BD=CF$.
$\because \angle DEC=\angle EBC+x=\angle ABC=y=\angle DCE$,
$\therefore DE=DC$.
$\therefore BE+DE=CF=CD+DF=CD+2AD$.
$\therefore BE=2AD$.