

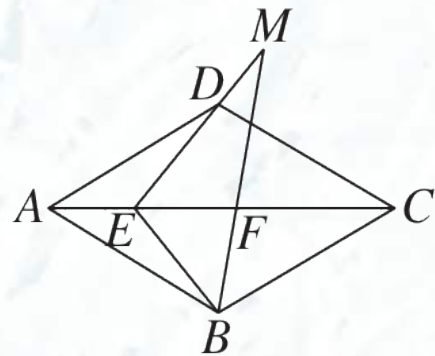


阶段拔尖专训4 在特殊四边形中的 结论判断

题型1 在菱形中的结论判断

1.[2024·菏泽期中] 如图, 点 E, F 在菱形 $ABCD$ 的对角线 AC 上, $\angle ADC = 120^\circ$, $\angle BEC = \angle CBF = 50^\circ$, ED 与 BF 的延长线交于点 M . 以下结论:

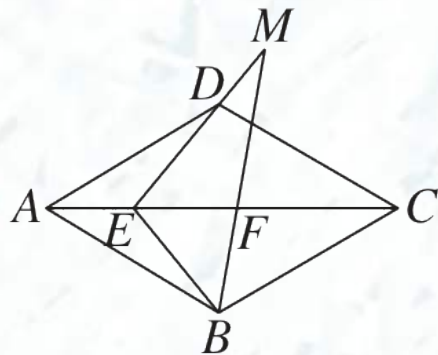
- ① $\angle BME = 30^\circ$;
- ② $\triangle ADE \cong \triangle ABE$;



(第1题)

③ $EM = BC$.

其中正确结论的个数是(**D**)



(第1题)

A.0

B.1

C.2

D.3

【点拨】∵ 四边形 $ABCD$ 是菱形，

$$\angle ADC = 120^\circ ,$$

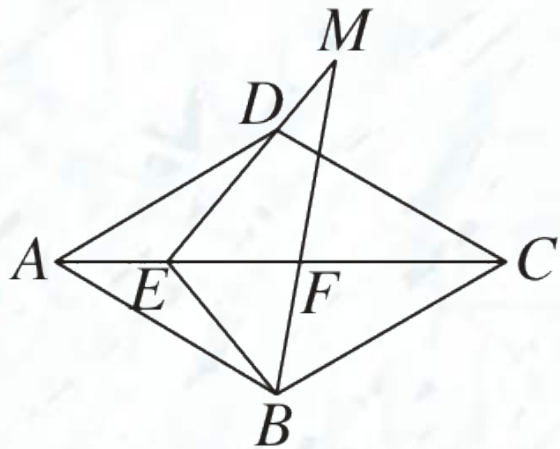
$$\therefore AD = AB = BC = CD ,$$

$$\angle BCD = 60^\circ , \quad \angle DAE = \angle BAE =$$

$$\angle DCE = \angle BCE. \therefore \angle BCE = 30^\circ .$$

$$\therefore \angle BFE = \angle BCE + \angle CBF = 30^\circ +$$

$$50^\circ = 80^\circ .$$



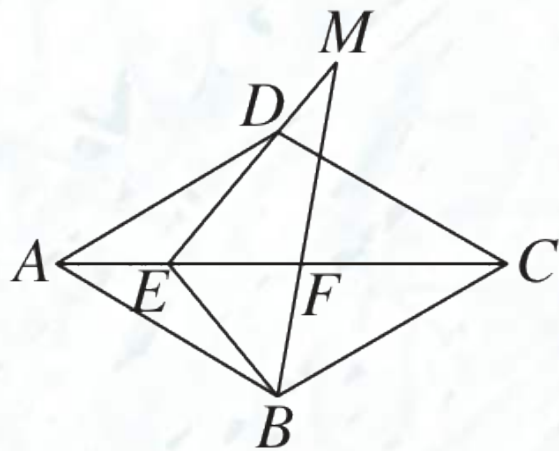
(第1题)

$\therefore \angle EBF = 180^\circ - \angle BEC - \angle BFE =$
 $180^\circ - 50^\circ - 80^\circ = 50^\circ .$

在 $\triangle CDE$ 和 $\triangle CBE$ 中, $\begin{cases} CD = CB, \\ \angle DCE = \angle BCE, \\ CE = CE, \end{cases}$

$\therefore \triangle CDE \cong \triangle CBE$ (SAS). $\therefore \angle DEC =$
 $\angle BEC = 50^\circ .$

$\therefore \angle BEM = \angle DEC + \angle BEC = 100^\circ .$



(第1题)

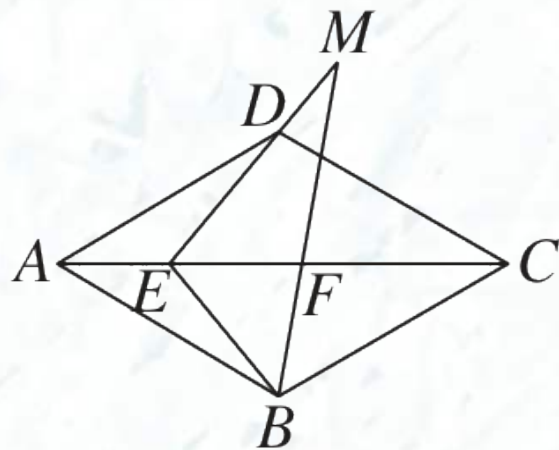
$\therefore \angle BME = 180^\circ - \angle BEM - \angle EBF =$
 $180^\circ - 100^\circ - 50^\circ = 30^\circ$.故①正确;

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

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

$\therefore \triangle ADE \cong \triangle ABE$ (SAS).故②正确;

$\therefore \angle EBC = \angle EBF + \angle CBF = 100^\circ$,



(第1题)

$\therefore \angle BEM = \angle EBC.$

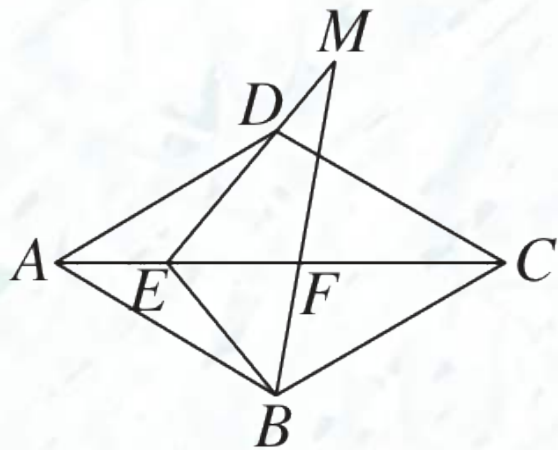
在 $\triangle BEM$ 和 $\triangle EBC$ 中,

$$\begin{cases} \angle BEM = \angle EBC, \\ \angle BME = \angle ECB = 30^\circ, \\ BE = EB, \end{cases}$$

$\therefore \triangle BEM \cong \triangle EBC(\text{AAS}).$

$\therefore EM = BC.$ 故③正确.

\therefore 正确结论的个数是3, 故选D.



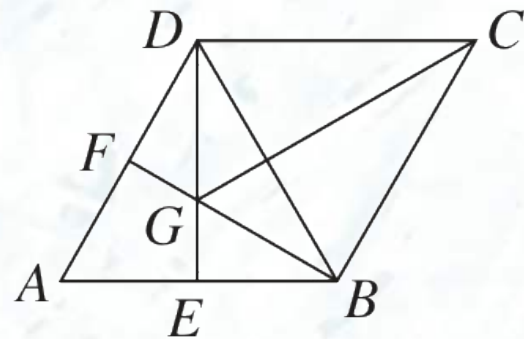
(第1题)

2.[2024·青岛阶段练习] 如图, 在菱形 $ABCD$ 中, $\angle A = 60^\circ$, E, F 分别是 AB, AD 的中点, DE, BF 相交于点 G , 连接 BD, CG . 有下列结论:

- ① $\angle BGD = 120^\circ$;
- ② $BG + DG = CG$;
- ③ $\triangle BDF \cong \triangle CGB$.

其中正确的结论有(**C**)

- A.0个
- B.1个
- C.2个
- D.3个



(第2题)



【点拨】∵ 四边形 $ABCD$ 是菱形，

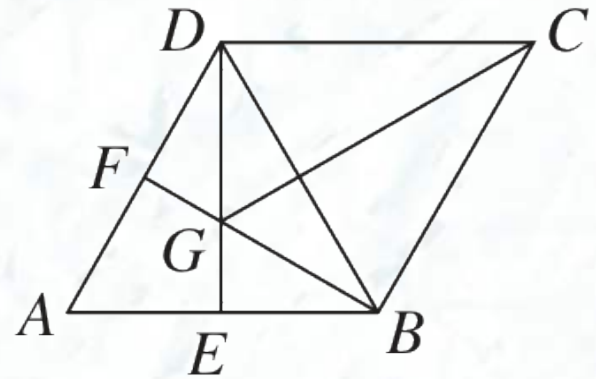
$$\angle A = 60^\circ ,$$

$$\therefore AB \parallel CD, AD \parallel BC,$$

$$AB = BC = CD = AD, \angle BCD = 60^\circ .$$

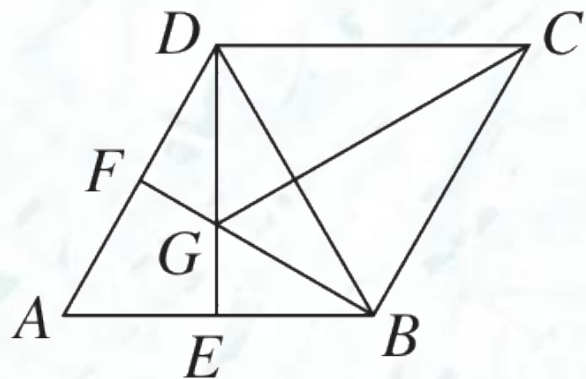
∴ $\triangle ABD$ 是等边三角形， $\triangle BDC$ 是等边三角形。

$$\therefore \angle ADB = \angle ABD = 60^\circ , BC = BD .$$



(第2题)

$\because E, F$ 分别是 AB, AD 的中点,
 $\therefore \angle BFD = \angle DEB = 90^\circ$.
 $\therefore \angle GDB = \angle GBD = 30^\circ$.
 $\therefore GB = GD, \angle BGD = 180^\circ - 30^\circ - 30^\circ = 120^\circ$.故①正确;



(第2题)

在 $\triangle CDG$ 和 $\triangle CBG$ 中,
$$\begin{cases} CD = CB, \\ CG = CG, \\ DG = BG, \end{cases}$$

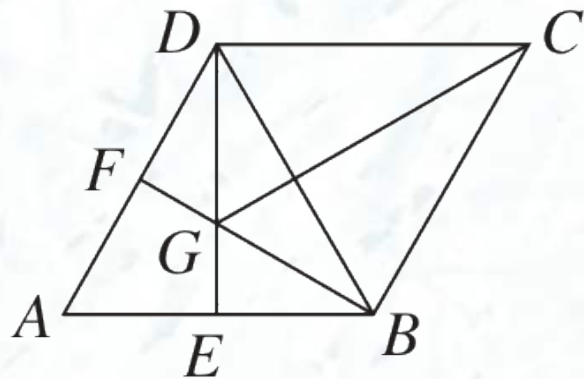
$\therefore \triangle CDG \cong \triangle CBG$ (SSS). $\therefore \angle DGC = \angle BGC = 60^\circ$.

$\therefore \angle BFD = \angle DEB = 90^\circ$, $AB \parallel CD$,
 $AD \parallel BC$,

$\therefore \angle GDC = \angle GBC = 90^\circ$.

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

$\therefore CG = 2GD = DG + BG$. 故②正确.



(第2题)

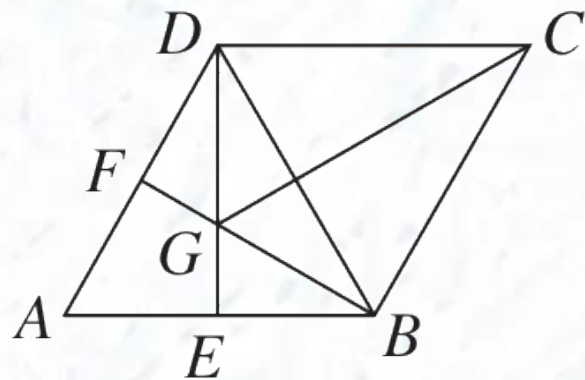
$\because \triangle GBC$ 为直角三角形, $\therefore CG > BC$.

$\therefore CG \neq BD$. $\therefore \triangle BDF$ 与 $\triangle CGB$ 不全

等. 故③错误;

\therefore 正确的结论有①②, 共2个. 故选

C.

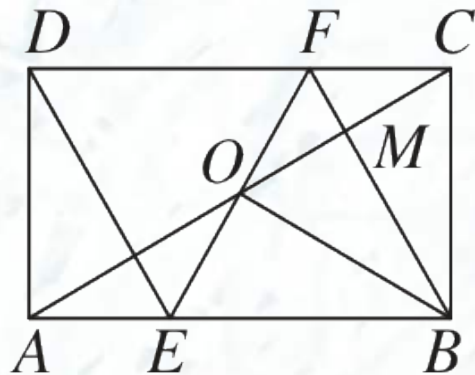


(第2题)

题型2 在矩形中的结论判断

3.如图, 矩形 $ABCD$ 中, O 为 AC 的中点, 过点 O 的直线分别与 AB , CD 交于点 E , F , 连接 BF 交 AC 于点 M , 连接 DE , BO .若 $\angle COB = 60^\circ$, $FO = FC$, 则下列结论:

① $FB \perp OC$;



(第3题)

② $\triangle EOB \cong \triangle CMB$;

③ 四边形 $EBFD$ 是菱形;

④ $MB:OE = 3:2$.

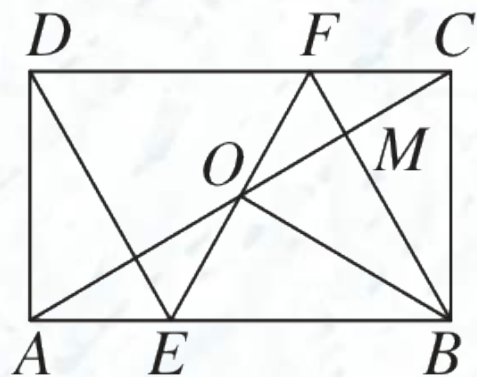
其中正确结论的个数是(**B**)

A.4

B.3

C.2

D.1



(第3题)

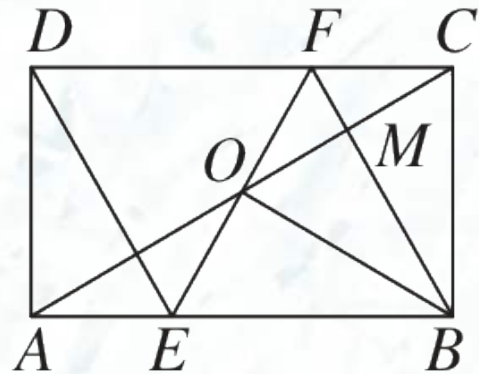
【点拨】 \because 四边形 $ABCD$ 是矩形, O 为 AC 的中点,

$\therefore AB = CD, AB \parallel CD,$

$\angle ABC = \angle BCD = 90^\circ, OA = OB = OC.$

又 $\because \angle COB = 60^\circ, \therefore \triangle OBC$ 是等边三角形.

$\therefore \angle ACB = \angle OBC = 60^\circ, BC = OB.$



(第3题)

又 $\because FO = FC$, $\therefore FB \perp OC$, 故①正确;

$\therefore \angle CBM = \angle MBO = 30^\circ$.

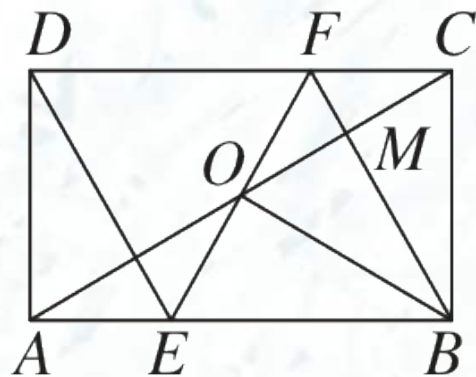
$\because \angle ABC = \angle BCD = 90^\circ$,

$\angle OBC = \angle OCB = 60^\circ$,

$\therefore \angle ABO = 30^\circ, \angle ACD = 30^\circ$.

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

$\angle EFB = \angle CFM = 90^\circ - 30^\circ = 60^\circ$.



(第3题)

$\therefore \triangle EFB$ 是等边三角形. $\therefore BE = BF$.

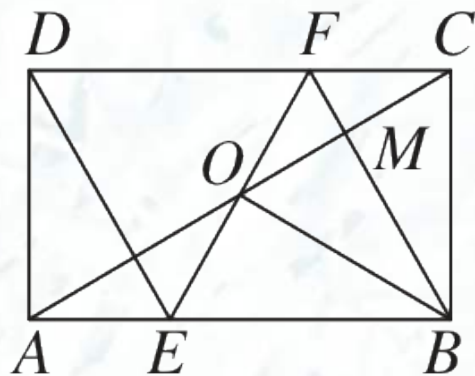
$\because AB \parallel CD, \therefore \angle ACD = \angle CAB$.

在 $\triangle FOC$ 和 $\triangle EOA$ 中,
$$\begin{cases} \angle FOC = \angle EOA, \\ \angle FCO = \angle EAO, \\ OC = OA, \end{cases}$$

$\therefore \triangle FOC \cong \triangle EOA(\text{AAS}). \therefore AE = CF,$

$OE = OF$.

$\because DC = AB, \therefore DF = EB$.



(第3题)

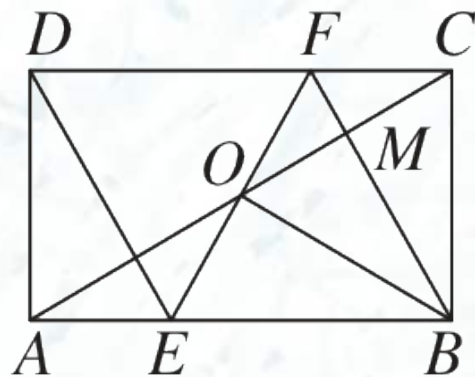
又 $\because DF \parallel EB$, \therefore 四边形 $EBFD$ 是平行四边
形.

又 $\because BE = BF$, \therefore 四边形 $EBFD$ 是菱形,
故③正确;

$\because BE = BF$, $BO = BC$,

$\angle EBO = \angle FBC = 30^\circ$,

$\therefore \triangle EOB \cong \triangle FCB$.



(第3题)

$\therefore \triangle EOB$ 与 $\triangle CMB$ 不全等, 故②错误;

设 $FM = a$.

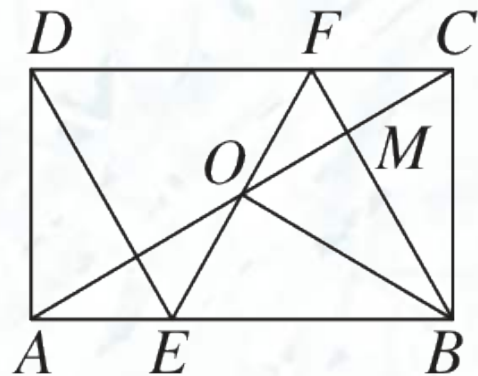
在 $\text{Rt}\triangle OFM$ 中, $\because \angle OFM = 60^\circ$,

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

$\therefore OE = OF = 2FM = 2a$.

$\because \angle FOM = 30^\circ, \angle COB = 60^\circ$,

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



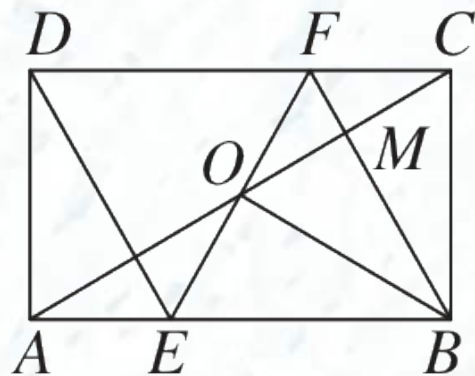
(第3题)

在 $\text{Rt}\triangle FOB$ 中, $\because \angle FBO = 30^\circ$,

$\therefore BF = 2OF = 4a. \therefore BM = 3a.$

$\therefore BM:OE = 3:2$, 故④正确.

综上, 正确的结论有①③④, 共3个, 故
选B.



(第3题)

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