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E٣٣٠٧

Arab Republic of Egypt
Ministry of Education
The completion of the basic education certificate
Examination 2015 for our sons abroad

Geometry **Second Term** **Time : 2 hours**

الهندسة بالإنجليزية للصف الثالث الاعدادى (الفصل الدراسى الثانى ٢٠١٥) (الأسئلة في صفحتين)

تنبيه هام : (يسلم الطالب ورقة امتحانية باللغة العربية مع الورقة المترجمة) (يسمح باستخدام الآلة الحاسبة)

Answer the following questions:-

First question:

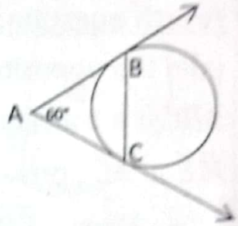
choose the correct answer from the given answers:

(1) If the point A belongs to the circle Mwhose length of its diameter = $6cm$ then $MA = \cdots.cm$

a) 3 b) 4 c)5 d) 6

(2)In the opposite figure $\overrightarrow{AB}$,$\overrightarrow{Ac}$ are two tangents ,

$m(\angle A) = 60°$.If $AB = 4cm$ then the length of $\overline{CB}$ equal ......cm



a) 3 b) 4 c)$4\sqrt{3}$ d) 8

(3) In the cyclic quadrilateral each two opposite angles are .....

a) alternate b) supplementary c) complementary d) equal

(4)The number of tangents which we can draw them from a point on the circle equal ....

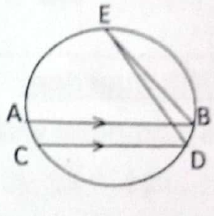
a)one b)two c)four d)infinite number

(5)The ratio between the measure of the inscribed angle to the measure of the central angle which subtended to the same arc equals .....

a)1:2 b)2:1 c)1:1 d)1:3

(6) In the opposite figure :$\overline{AB}$,$\overline{CD}$ are parallel chords

$m(\widehat{AC}) = 30°$then$m(\angle BED) =$......

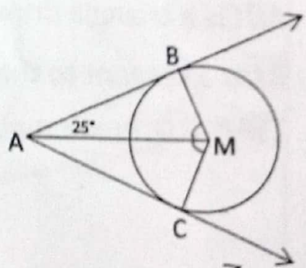


a)10° b)15° c)30° d)60°

Second question:

(a) In the opposite figure:

$\overrightarrow{AB}$,$\overrightarrow{AC}$are two tangents to the circle M at B, C respectively .$m(\angle BAM) = 25°$.Prove that :

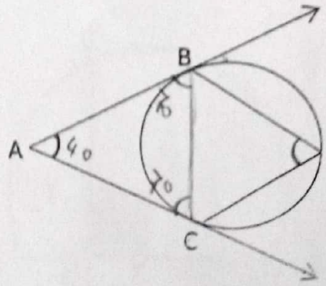


- First: $\overrightarrow{AM}$ bisects ($\angle$ BMC)
- second: find with proof $m(\angle BMC)$

(b) In the opposite figure:

$\overrightarrow{AB}$,$\overrightarrow{AC}$are two tangents to the circle at B, C . $m(\angle A) = 40°$

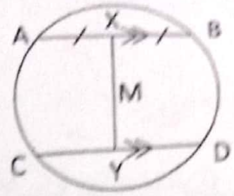
find with proof $m(\angle D)$.



(بقية الأسئلة في الصفحة الثانية)

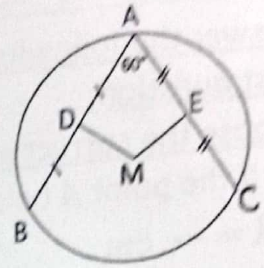
Third question:

(a)In the opposite figure:



$M$is a circle, $\overline{AB} \parallel \overline{CD}$, X is the mid-point of $\overline{AB}$,$\overrightarrow{XM}$ is drawn to cut $\overline{CD}$at Y . Prove that Y is the midpoint of CD.

(b)In the opposite figure:



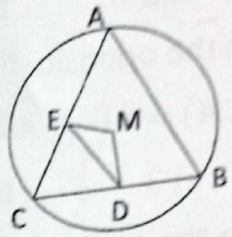
$\overline{AB}$,$\overline{AC}$are two chords in circle M , D is the mid-point of $\overline{AB}$,

$E$is the mid-point of $\overline{AC}$, $m(\angle BAC) = 60°$

Find with proof $m(\angle DME)$.

Fourth question:

(a)In the opposite figure:

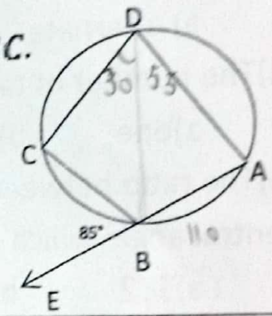


ABC is a triangle drawn inside a circle M,$\overline{MD} \perp \overline{BC}$,

$\overline{ME} \perp \overline{AC}$, prove that:

- **First:** $\overline{ED} \parallel \overline{AB}$.
- **Second** :Perimeter of triangle CED $= \frac{1}{2}$perimeter of triangle ABC.

(b)In the opposite figure:



$E \in \overrightarrow{AB}$, $E \notin \overline{AB}$, $m(\widehat{AB}) = 110°$,$m(\angle CBE) = 85°$

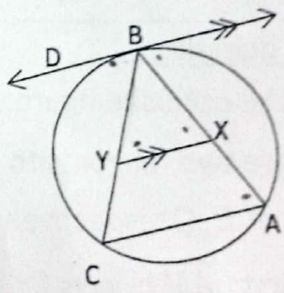
Find with proof m($\angle BDC$).

Fifth question:

(a)Complete with proof. The measure of the angle of tangency equal the measure

...opposite to it's Chord

(b)In the opposite figure:



$ABC$is a triangle drawn inside a circle,

$\overleftrightarrow{BD}$is a tangent to the circle at B ,

$\overline{XY} \parallel \overline{BD}$ .Prove that :$AXYC$ is a cyclic quad.

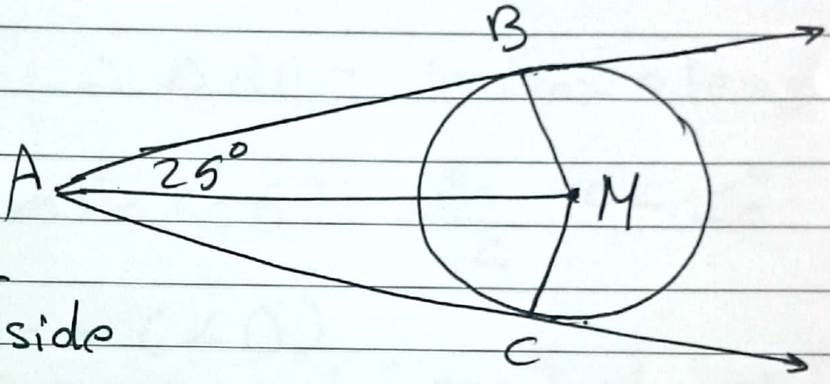
(انتهت الأسئلة)

Geometry 2015
- 2nd term -

Q.1 Choose

1. (a) 3
2. (b) 4
3. (b) supplementary
4. (a) one
5. (a) $1:2$
6. (b) 15°

Q.2 (a)



Proof:

In $\triangle MBA$, $\triangle MCA$:

$\overline{AM}$ is a common side
$MB = MC = r$
$m(\angle ABM) = m(\angle ACM) = 90^\circ$ (tangent and radius)

$\therefore \triangle MBA \equiv \triangle MCA$
and from congruency:

$m(\angle BMA) = m(\angle CMA)$
$\therefore \overrightarrow{MA}$ bisects $(\angle BMC)$ #1

In the figure ABMC:
$\because m(\angle B) + m(\angle C) = 90 + 90 = 180^\circ$
and they're opposite
$\therefore$ ABMC is cyclic quad.

$\therefore m(\angle BMC) = 180 - (2 \times 25) = 130^\circ$
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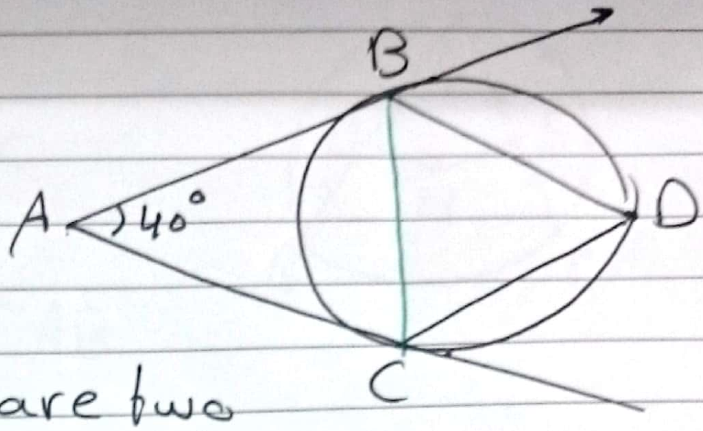
$\boxed{Q.2}$ (b)



Construction:

Join $\overline{BC}$

Proof

$\because$ $\overline{AB}$, $\overline{AC}$ are two tangents segments from A

$\therefore$ $AB = AC$ $\quad\therefore$ $\triangle ABC$ is isosceles

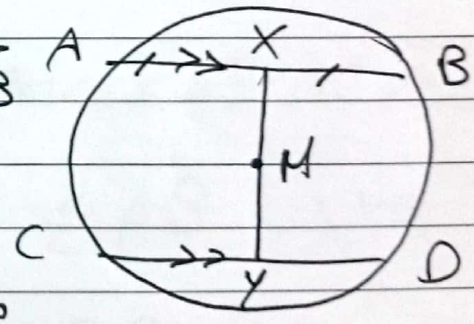
$\therefore$ $m(\angle ABC) = m(\angle ACB) = \frac{180-40}{2} = 70°$

$\because$ $m(\angle ABC) = m(\angle D)$

(angle of tangency and inscribed in the opposite side of chord of tangency)

$\therefore$ $m(\angle D) = 70°$ #

$\boxed{Q.3}$ (a) proof



$\because$ X is mid point of $\overline{AB}$

$\therefore$ $\overline{MX} \perp \overline{AB}$

$\because$ $\overline{AB} \parallel \overline{CD}$

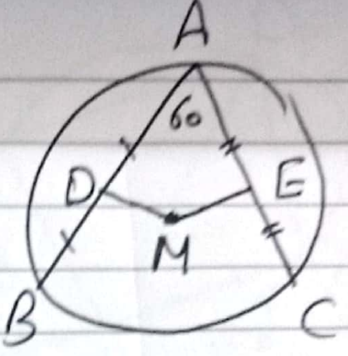
$\therefore$ $m(\angle BXY) = m(\angle XYC) = 90°$ (alternate)

$\therefore$ $\overline{MY} \perp \overline{CD}$

$\therefore$ Y is mid point of $\overline{CD}$ #

(18)

$\boxed{Q.3}$ (b) Proof



$\because$ E is midpoint of $\overline{AC}$

$\therefore \overline{ME} \perp \overline{AC}$

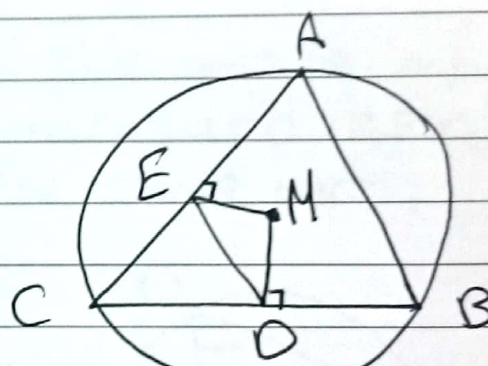
$\because$ D is midpoint of $\overline{AB}$

$\therefore \overline{MD} \perp \overline{AB}$

In the quadrilateral AEMD :-

$m(\angle EMD) = 360 - (90 + 90 + 60) = 120°$ #

$\boxed{Q.4}$ (a) Proof :



$\because \overline{MD} \perp \overline{CB}$

$\therefore$ D is midpoint of $\overline{CB}$

$\because \overline{ME} \perp \overline{AC}$

$\therefore$ E is midpoint of $\overline{AC}$

In $\triangle ABC$: E, D are midpoints of $\overline{AC}, \overline{BC}$

$\therefore \overline{ED} \parallel \overline{AB}$, $ED = \frac{1}{2} AB$. $\#_1$

$\because$ Peremeter of $\triangle CED = CE + ED + DC$

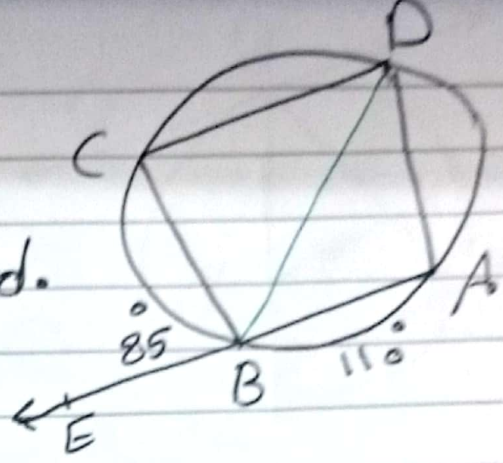
$\because CE = \frac{1}{2} AC$, $ED = \frac{1}{2} AB$, $CD = \frac{1}{2} CB$

$\therefore$ per. of $\triangle CED = \frac{1}{2} AC + \frac{1}{2} AB + \frac{1}{2} CB$

$= \frac{1}{2}(AC + AB + CB) = \frac{1}{2}$ per. of $\triangle ABC$

$\#_2$

Q.4 (b) Join $\overline{BD}$



Proof

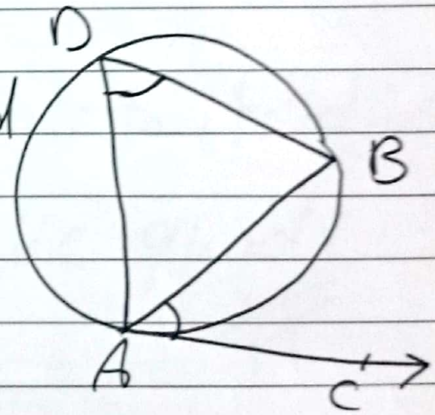
$\because$ ABCD is cyclic quad.

$\therefore m(\angle CBE) = m(\angle ADC)$
$= 85^\circ$
(exterior and interior opposite to its adjacent)

$\because m(\angle ADB) = \frac{1}{2} m(\overset{\frown}{AB}) = \frac{1}{2} \times 110^\circ = 55^\circ$

$\therefore m(\angle BDC) = 85 - 55 = 30^\circ$ #

Q.5 (a) The measure of the angle of tangency equal the measure inscribed angle subtended by the same arc.



Given: $\angle BAC$ is an angle of tangency, $\angle D$ is inscribed

R.T.P

$m(\angle BAC) = m(\angle D)$

Proof

$\because \angle BAC$ is an angle of tangency

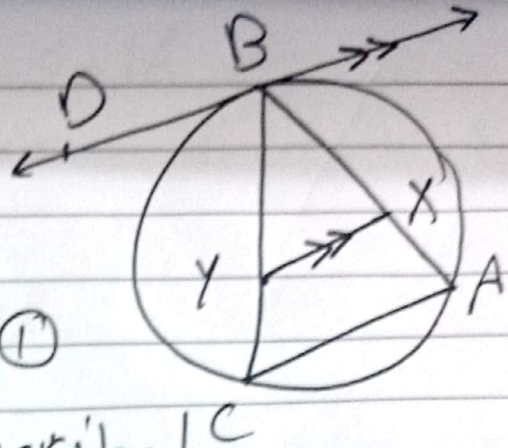
$\therefore m(\angle BAC) = \frac{1}{2} m(\overset{\frown}{AB})$ (1)

$\because \angle D$ is an iscribed angle

$\therefore m(\angle D) = \frac{1}{2} m(\overset{\frown}{AB})$ (2)

From (1), (2) $\therefore m(\angle BAC) = m(\angle D)$ #

Q.5 (b) proof



$\because \overline{BD}$ is a tangent at B

$\therefore m(\angle DBC) = m(\angle A)$ (1)

(angle of tangency and inscribed on the same arc)

$\because \overleftrightarrow{BD} \parallel \overline{XY}$

$\therefore m(\angle DBC) = m(\angle BYX) \rightarrow$ (2)

(alternate)

From (1), (2)

$\therefore m(\angle A) = m(\angle BYX)$

(exterior and interior opposite to its adjacent)

$\therefore$ XYCA is a cyclic quad.

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