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[ف ٢ (أ)]

ARAB REPUBLIC OF EGYPT

E ٢٢١١

Ministry Of Education

Third Year Preparatory Exam for Our Sons Abroad - Second Term 2017

الهكسة بالانجليزية للصف الثالث الإعدادى

eometry

الفصل الدراسى الثانى ٢٠١٧

Time: 2 Hours

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

(الأسئلة فى صفحتين)

nswer the following questions:

irst Question: Choose the correct answer from those between brackets:

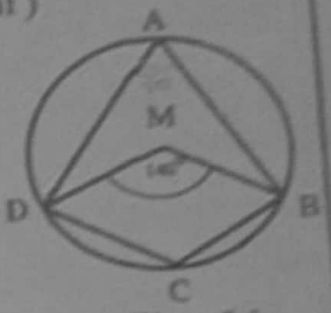
) From a point outside a circle, we can draw ..... tangents to the circle.

(One , Two , Infinite number , Three)

) The measure of the central angle equals ..... the measure of the inscribed angle, subtended to the same arc. (Twice , three times , Four times , half)

) In the opposite figure , If $m(\angle BMD) = 140°$ then $m(\angle C) =$ .....

($70°$, $110°$, $140°$, $90°$)



) The measure of a quarter of a circle = ...

($\frac{1}{2}\pi r$, $90°$, $180°$, $45°$)

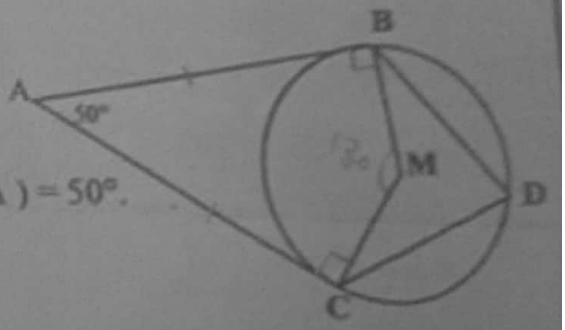
A circle of radius length 5 cm, If the straight Line L is 3 cm apart of its center, Then L is... (Tangent, outside the circle, intersects the circle at two points, axis of symmetry to the circle)

Two circles M & N, touching each other externally, The length of the two radii 3 cm, 8 cm, Then MN = ... cm (3 , 5 , 8 , 11)

econd Question:

) **In the opposite figure:**

$\overline{AB}, \overline{AC}$ are two tangents to the circle M at B, C, $m(\angle A) = 50°$.



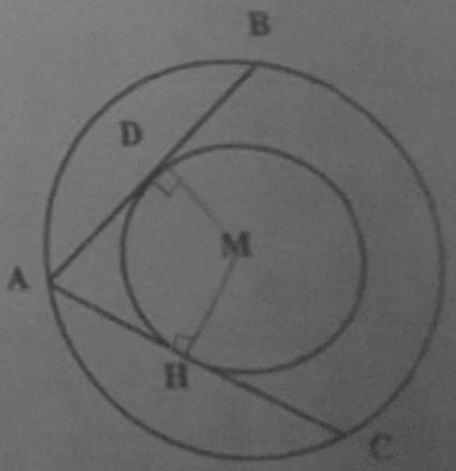
* Prove that the figure $ABMC$ is a cyclic quad.

* Find $m(\angle D)$.

) **In the opposite figure:**

Two concentric circles, $\overline{AB}, \overline{AC}$ are two chords in the greater circle, touching the smaller circle at D, H.

Prove that : $AB = AC$.



(بقية الأسئلة فى الصفحة الثانية)

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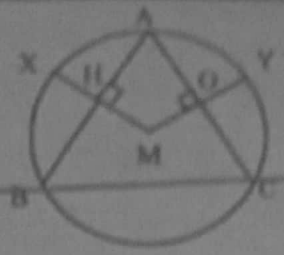
Third Question:

A) **In the opposite figure:**

$\overline{MX} \perp \overline{AB}$, $\overline{MY} \perp \overline{AC}$, $AB = AC$,

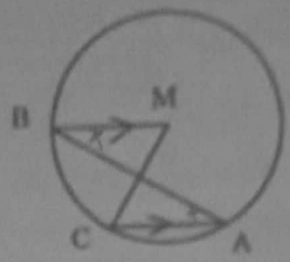
Prove that: $XH = YO$



B) **In the opposite figure:**

If $\overline{MB} // \overline{AC}$,

Prove that: m (∠ M) = 2m (∠ B).



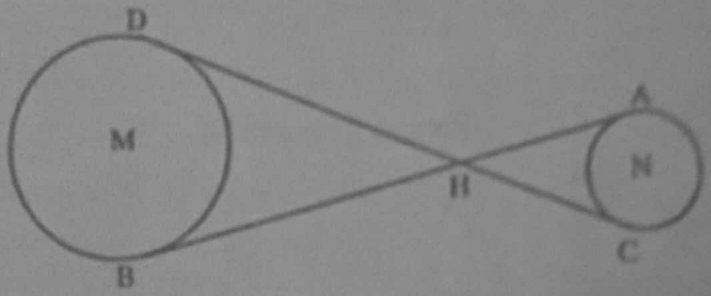
Fourth Question:

A) Mention two cases such that the quadrilateral is a cyclic quad.

B) **In the opposite figure:**

$\overline{AB}$, $\overline{CD}$ are two tangents to the two circles M, N

Prove that: $AB = CD$.



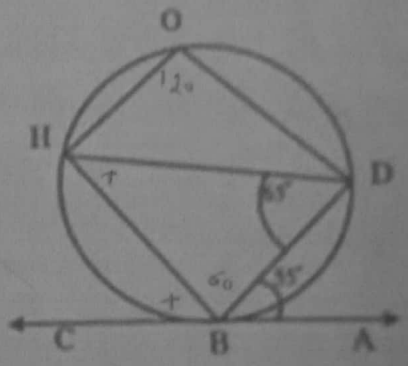
Fifth Question:

A) **In the opposite figure:**

$\overleftrightarrow{AC}$ is a tangent to the circle, m(∠ABD) = 55°,

m(∠BDH) = 65°

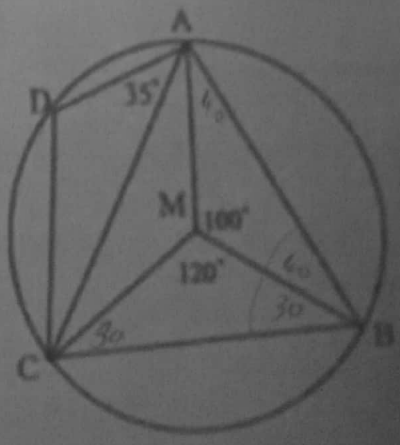
Find m(∠O).



B) **In the opposite figure:**

m(∠AMB) = 100°, m(∠BMC) = 120°, m(∠DAC) = 35°,

- Find m(∠D).
- Prove that $DA = DC$.



(انتهت الأسئلة)

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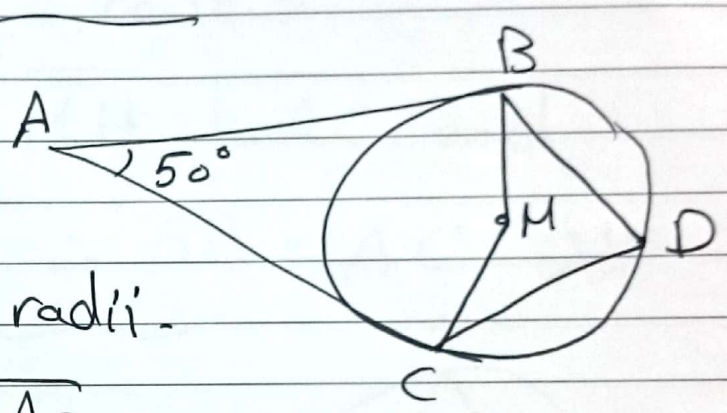
Geometry 2017
- 2nd term -

Q.1 Choose

1. Two
2. Twice
3. 110°
4. 90°
5. intersects the circle at two points
6. 11 cm

Q.2 (a) Proof



$\because \overline{AB}, \overline{AC}$ are two tangents and $\overline{MB}, \overline{MC}$ are two radii.

$\therefore \overline{MB} \perp \overline{AB}, \overline{MC} \perp \overline{AC}$

$\therefore m(\angle ABM) = m(\angle ACM) = 90^\circ$

$\therefore m(\angle ABM) + m(\angle ACM) = 90 + 90 = 180^\circ$ and they're opposite

$\therefore$ ABMC is cyclic quad. ✱1

$\therefore m(\angle M) = 180 - 50 = 130^\circ$

$\therefore m(\angle D) = \frac{1}{2} m(\angle M)$ (inscribed and central)

$\therefore m(\angle D) = \frac{1}{2} \times 130^\circ = 65^\circ$

✱4

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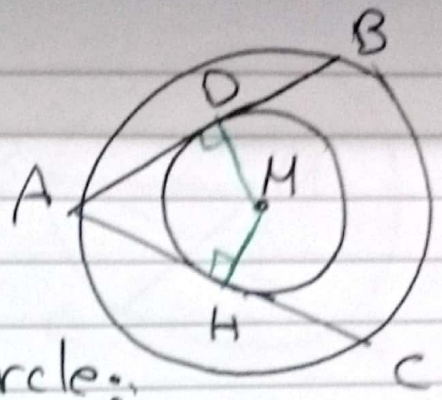
Q.2 (b) Construction



draw: $\overline{MD} \perp \overline{AB}$
, $\overline{MH} \perp \overline{AC}$

Proof

In the smaller circle:

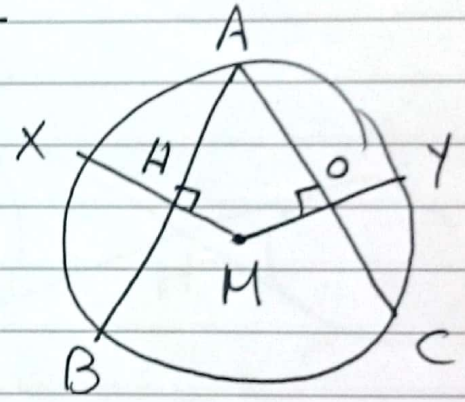
$\because MD = MH$ = radius

In the greater circle:

$\because \overline{MD} \perp \overline{AB}$, $\overline{MH} \perp \overline{AC}$ and

$MH = MD$ $\therefore AB = AC$ ✱

Q.3 (a) Proof



$\because \overline{MX} \perp \overline{AB}$, $\overline{MY} \perp \overline{AC}$
and $AB = AC$

$\therefore MH = MO \rightarrow (1)$

$\because MY = MX$ = radius $\rightarrow (2)$

by subtracting (1) from (2)

$\therefore XH = YO$ ✱

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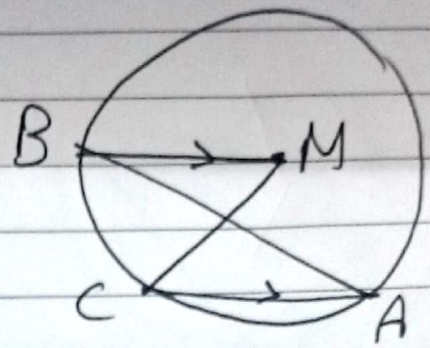
Q.3 (b) proof:



$\because m(\angle M) = m(\overset{\frown}{BC})$ (central)

$\therefore m(\angle A) = \frac{1}{2} m(\overset{\frown}{BC})$ (inscribed)

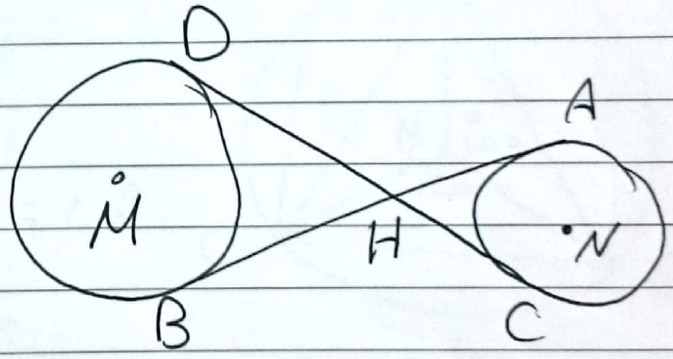
$\because \overline{BM} \parallel \overline{AC}$ $\quad \therefore m(\angle B) = m(\angle A)$ (alternate)

$\therefore m(\angle B) = \frac{1}{2} m(\overset{\frown}{BC})$

$\therefore m(\angle M) = m(\overset{\frown}{BC}) = 2m(\angle B)$ ##

Q.4 (a) solved in 2016

(b) Proof:-



For Circle N:-

$\because \overline{HA}, \overline{HC}$ are two tangents From H

$\therefore HA = HC \rightarrow (1)$

For Circle M:-

$\because \overline{HD}, \overline{HB}$ are two tangents From H

$\therefore HD = HB \rightarrow (2)$

by adding (1) + (2)

$\therefore AH + HB = CH + HD$

$\therefore AB = CD$ ##

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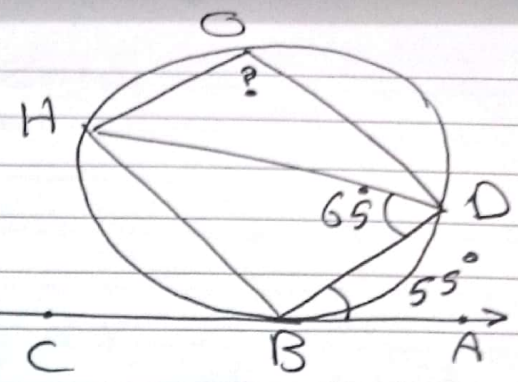
Q.5 (a) Proof



$\because \overrightarrow{BA}$ is a tangent and $\overline{BD}$ is a chord

$\therefore m(\angle ABD) = m(\angle BHD)$

$= 55°$

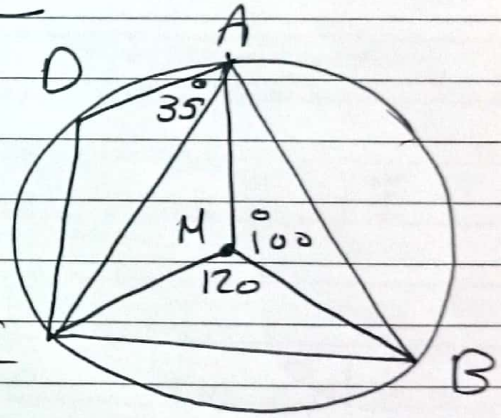
In $\triangle BDH$:

$m(\angle DBH) = 180 - (55+65) = 60°$

$\because$ BDOH is a cyclic quad.

$\therefore m(\angle O) = 180 - 60 = 120°$ ✱

Q.5 (b) Proof



In $\triangle AMB$:-

$\because MA = MB = \text{radius}$

$\therefore m(\angle ABM) = \frac{180-100}{2} = 40°$

In $\triangle CMB$

$\because MB = MC = \text{radius}$

$\therefore m(\angle MBC) = \frac{180-120}{2} = 30°$

$\because m(\angle ABC) = 30 + 40 = 70°$

$\because$ ABCD is cyclic quad.

$\therefore m(\angle D) = 180 - 70 = 110°$ ✱1

In $\triangle ADC$:

$\because m(\angle ACD) = 180 - (35+110)$

$= 35°$

$\therefore m(\angle DAC) = m(\angle DCA) = 35°$

$\therefore DA = DC$ ✱2

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