UNIVERSITI SAINS MALAYSIA

Peperiksaan Semester Kedua
Sidang Akademik 2004/2005

Mac 2005

MGM 531 – EUCLIDEAN GEOMETRY
[GEOMETRI EUKLIDEN]

Duration : 3 hours

[Masa : 3 jam]

Please check that this examination paper consists of **SIX [6]** pages of printed material before you begin the examination.

Answer **all seven** questions.

Sila pastikan bahawa kertas peperiksaan ini mengandungi **ENAM [6]** muka surat yang bercetak sebelum anda memulakan peperiksaan ini.

Jawab **semua tujuh** soalan.

...2/-

1. (a) Give the definition of parallelism of two straight lines
   (b) If three straight lines L_1, L_2 and L_3 are such that $L_1 // L_2, L_2 // L_3$, show that $L_1 // L_3$.

[100 marks]

1. (a) Beri definasi untuk keselarian dua garis lurus
(b) Diberi tiga garis lurus L_1, L_2 dan L_3 *supaya* $L_1 // L_2, L_2 // L_3$, *tunjukkan bahawa* $L_1 // L_3$.

[100 markah]

2. Given a triangle ABC, and D, E, F are respectively midpoints of BC, AC and AB. show that

   (a) $AD < \frac{1}{2}(AB + AC)$

   (b) $AD > \frac{1}{2}(AB + AC - BC)$

   (c) $AB + BC + CA < 2(AD + BE + CF)$

   (d) $AD + BE + CF < AB + BC + CA$

[100 marks]

2. *Diberi segitiga ABC, dan D, E, F ialah titik tengah BC, AC, AB masing-masing. Tunjukkan bahawa*

   (b) $AD < \frac{1}{2}(AB + AC)$

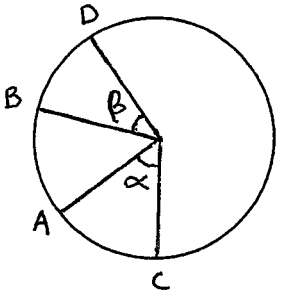
   (b) $AD > \frac{1}{2}(AB + AC - BC)$

   (c) $AB + BC + CA < 2(AD + BE + CF)$

   (d) $AD + BE + CF < AB + BC + CA$

[100 markah]

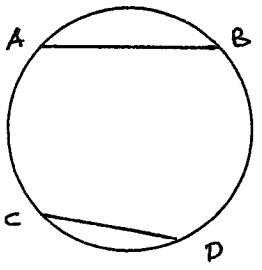
3. (a) Refer to the Figure
   Show that $\alpha > \beta$ iff $AC > BD$
   iff lengh $\overset{\frown}{AC}$ > lengh of $\overset{\frown}{BD}$



[50 marks]

(b) Refer to the Figure
$AB = 2CD$

Show that length $\overset{\frown}{AB} > 2$ (length of $\overset{\frown}{CD}$)

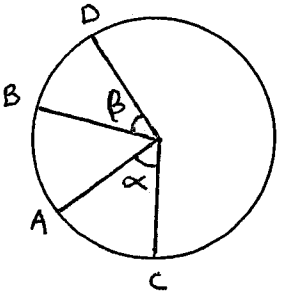


[50 marks]

3. *(a) Rujuk kepada gambarajah*

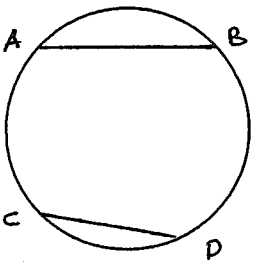
Tunjukkan bahawa $\alpha > \beta$ j.d.h.j. $AC > BD$

j.d.h.j panjang $\overset{\frown}{AC}$ *> panjang of* $\overset{\frown}{BD}$



[50 markah]

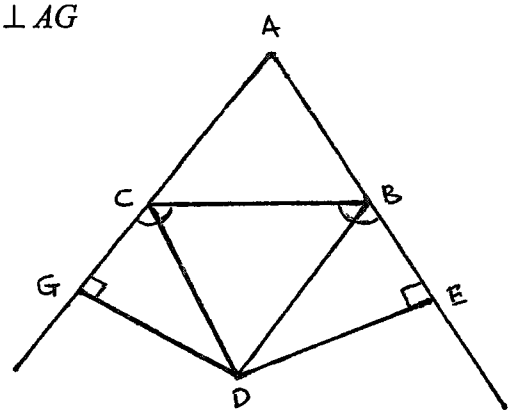
(b) Rujuk kepada gambarajah
Diberi $AB = 2CD$
Tunjukkan bahawa panjang $\overset{\frown}{AB} > 2$ (panjang $\overset{\frown}{CD}$)



[50 markah]

4. Refer to the Figure. The bisectors of $\measuredangle GCB$ and $\measuredangle EBC$ meet at D and $DE \perp AE, DG \perp AG$
Show that

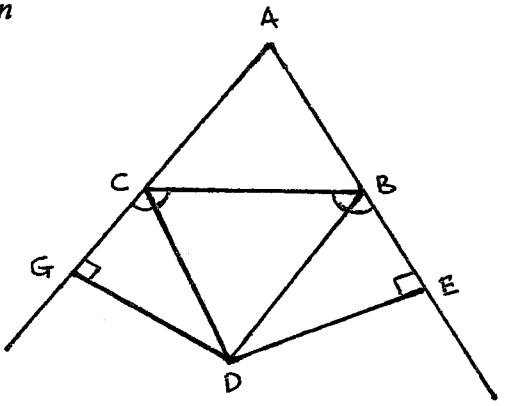
$$AE = \frac{1}{2}(AB + BC + CA)$$



[100 marks]

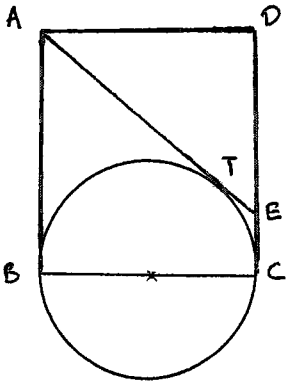
4. *Rujuk kepada gambarajah. Pembahagi dua sama* $\measuredangle GCB$ *dan* $\measuredangle EBC$ *bersilang pada D dan* $DE \perp AE, DG \perp AG$ *Tunjukkan bahawa*

$$AE = \frac{1}{2}(AB + BC + CA)$$



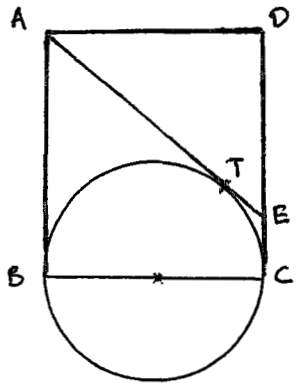
[100 markah]

5. Refer to the Figure
$ABCD$ is a square with side length 2.
BC is a diameter of the circle and
AE is a tangent to the circle at T
Find EC and the area of $\triangle ADT$



[100 marks]

5. *Rujuk kepada gambarajah ABCD ialah satu segiempat sama dengan panjang sisinya 2. BC ialah diameter bulatan dan AE ialah tangent kepada bulatan pada T Cari EC dan hitungkan luas $\triangle ADT$*



[100 markah]

6. Given a triangle ABC. If the inscribed circle touches the sides BC, CA and AB at D, E and F respectively, show that AD, BE and CF are concurrent.

[100 marks]

6. *Diberi segitiga ABC. Jika bulatan terterap dalam $\triangle ABC$ menyentuh BC, CA dan AB pada D, E dan F masing-masing, tunjukan bahawa AD, BE dan CF bersilang pada satu titik.*

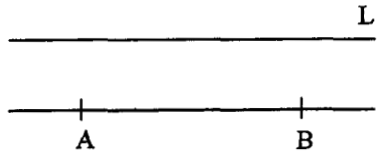
[100 markah]

7. (a) Given a circle. Explain how you can find the center of the circle using ruler and compass, give reason to your method.

[50 marks]

(b) Given a line segment AB and a line L parallel to AB as shown.

Explain how you can find the Midpoint of A B using only ruler.



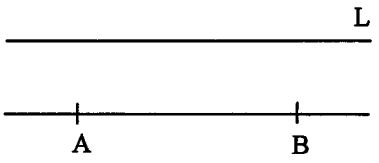
[50 marks]

7. *(a) Diberi satu bulatan*
Jelaskan bagaimana pusat bulatan itu dapat ditentukan dengan menggunakan "ruler" dan "compass" sahaja.

[50 markah]

(b) *Diberi satu segmen AB dan garis lurus L yang selari dengan AB seperti yang dalam gambarajah.*

Jelaskan bagaimana titik tengah AB dapat ditentukan dengan menggunakan "ruler" sahaja.



[50 markah]

- ooo O ooo -