1990 HG10

以 A、B 及 C 為圓心的三個圓兩兩相切如圖四。若 A、B 及 C 共線，且 PQ 是兩個較小圓的公切綫，其中 $PQ = 4$，試以 π 表陰影面積。

Three circles, with centres A, B and C respectively, touch one another as shown in figure 4. If A, B and C are collinear and PQ is a common tangent to the two smaller circles, where $PQ = 4$, find the area of the shaded part in terms of π.

1991 HI18

在圖中，$XA = 10$ cm、$AB = 2$ cm、$XD = 8$ cm 及 $DC = x$ cm，求 x 的值。

In the figure, $XA = 10$ cm, $AB = 2$ cm, $XD = 8$ cm and $DC = x$ cm. Find the value of x.

2000 FG1.4

在圖中，PA 切圓於 A，O 為圓心。
如果 $PA = 6$，$BC = 9$，$PB = d$，求 d 的值。

In the figure, PA touches the circle with centre O at A. If $PA = 6$, $BC = 9$, $PB = d$, find the value of d.

2003 FG4.4

如圖，ΔABC 是等邊三角形，M 及 N 分別是 AB 及 AC 的中點，F 是直線 MN 與圓 ABC 的交點。若 $d = \dfrac{MF}{MN}$，求 d 的值。

In the figure, ΔABC is an equilateral triangle, points M and N are the midpoints of sides AB and AC respectively, and F is the intersection of the line MN with the circle ABC.
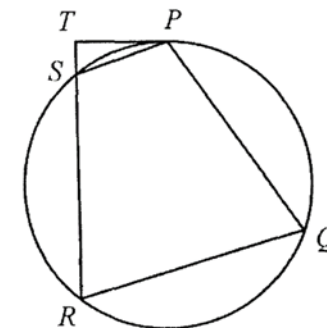If $d = \dfrac{MF}{MN}$, find the value of d.
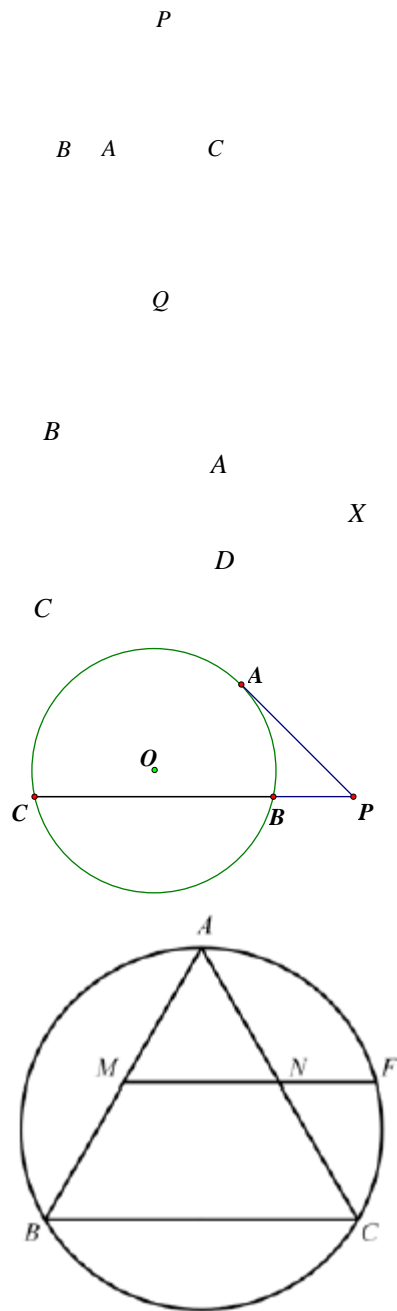
2008 FG3.1

如圖，$PQRS$ 是一個圓內接四邊形，其中 S 在直線 RT 上且 TP 為該圓的切綫。
若 $RS = 8$ cm，$RT = 11$ cm 及 $TP = k$ cm，求 k 的值。

In the figure, $PQRS$ is a cyclic quadrilateral, where S is on the straight line RT and TP is tangent to the circle. If $RS = 8$ cm, $RT = 11$ cm and $TP = k$ cm, find the value of k.

2010 FG4.4

在圖中，BEC 是一半圓形及 F 是直徑 BC 上的一點。已知 $BF : FC = 3 : 1$，$AB = 8$ 及 $AE = 4$。求 EC 的長度。

In the figure, BEC is a semicircle and F is a point on the diameter BC. Given that $BF : FC = 3 : 1$, $AB = 8$ and $AE = 4$. Find the length of EC.
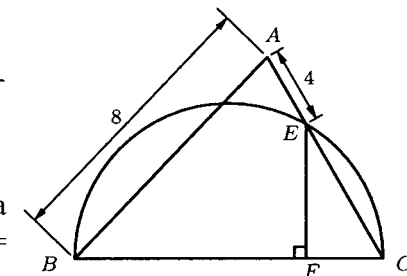
2011 FG1.1

在圖中，BC 為圓的直徑，A 為圓上的一點，AB、AC 及 AD 為綫段，而且 AD 垂直 BC。
若 $BD = 1$，$DC = 4$ 及 $AD = a$，求 a 的值。

In the figure, BC is the diameter of the circle. A is a point on the circle, AB and AC are line segments and AD is a line segment perpendicular to BC.
If $BD = 1$, $DC = 4$ and $AD = a$, find the value of a.
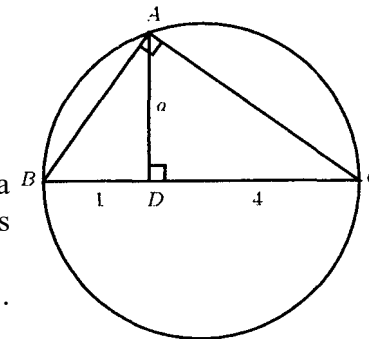
2015 HI10

B、H 及 I 為圓上的點。C 是該圓外的一點。BC 是該圓在點 B 的切綫。HC 和 IC 分別通過該圓於點 D 及 G。已知 HDC 是 $\angle BCI$ 的角平分綫、$BC = 12$、$DC = 6$ 及 $GC = 9$，求 $\dfrac{\Delta BDH \text{的面積}}{DHIG \text{的面積}}$ 的值。

B, H and I are points on the circle. C is a point outside the circle. BC is tangent to the circle at B. HC and IC cut the circle at D and G respectively. It is given that HDC is the angle bisector of $\angle BCI$, $BC = 12$, $DC = 6$ and $GC = 9$.
Find the value of $\dfrac{\text{area of } \Delta BDH}{\text{area of } DHIG}$.

2015 HG9

已知圖中的 *ABC* 為等邊三角形，*AF* = 2、
FG = 10、*GC* = 1 及 *DE* = 5。求 *HI* 的值。
Given that, in the figure, *ABC* is an equilateral
triangle with *AF* = 2, *FG* = 10, *GC* = 1 and
DE = 5. Find the value of *HI* .
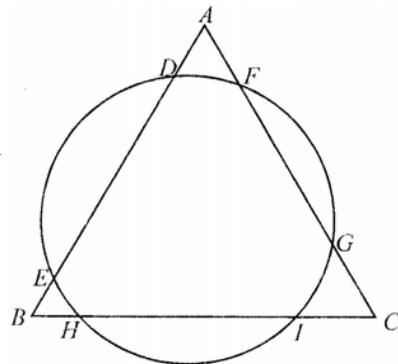
2016 HI12

如圖所示，*ABC*，*CDEF* 及 *FGH* 皆為直線，且
ABC // *FGH*。*AB* = 42，*GH* = 40，*EF* = 6 及
FG = 8。已知 *ABC* 與 *FGH* 之間的距離為 41，
求 *BC* 的值。
As shown in Figure 2, *ABC*, *CDEF* and *FGH* are
straight lines, *ABC* // *FGH*, *AB* = 42, *GH* = 40,
EF = 6 and *FG* = 8. Given that the distance between
*ABC* and *FGH* is 41, find the value of *BC*.
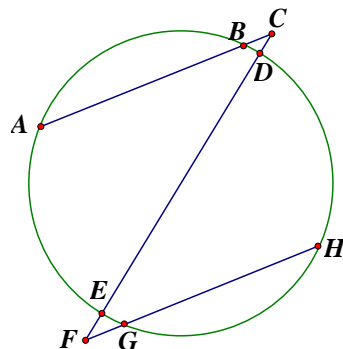
2017 HG4

在圖中，*O* 是圓心。弦 *AB* 及半徑 *OD* 的延
綫相交於 *C*。已知 *OA* = 25、*AB* = 30
及 *BC* = 6。求 *CD* 的長。
In the figure, *O* is the centre of the circle.
Chord *AB* and radius *OD* are produced to meet at *C*.
Given that *OA* = 25, *AB* = 30 and *BC* = 6,
find the length of *CD* .
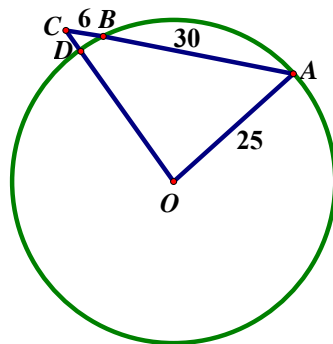
2017 HG9

在圖中，*ABC* 是一個等邊三角形且與一
圓相交於六點：*P*、*Q*、*R*、*S*、*T* 及 *U*。
若 *AS* = 3，*SR* = 13，*RC* = 2 及 *UT* = 8，
求 *BP* – *QC* 的值。

In the figure, *ABC* is an equilateral triangle
intersecting the circle at six points *P*, *Q*, *R*,
S, *T* and *U*. If *AS* = 3, *SR* = 13, *RC* = 2 and
UT = 8, find the value of *BP* – *QC* .
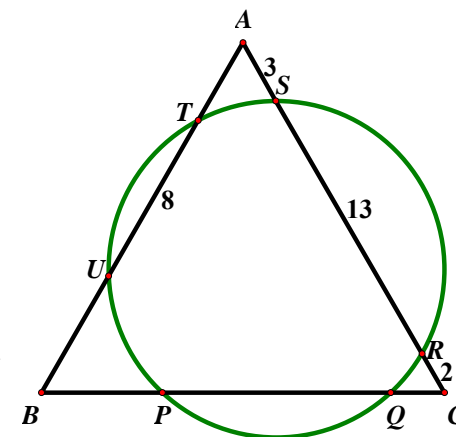
2018 HG3

如圖所示，*OAB* 是一個以 *O* 為圓心的
扇形。*N* 為半徑 *OM* 與 *AB* 的交點。已
知 *AN* = 12 ， *BN* = 7 及 3*ON* = 2*MN* 。
求 *OM* 的長度。
As shown in the figure, *OAB* is a sector with
centre *O* . *N* is the intersecting point of
radius *OM* and *AB* . Given that *AN* = 12, *BN*
= 7 and 3*ON* = 2*MN* .
Find the length of *OM* .
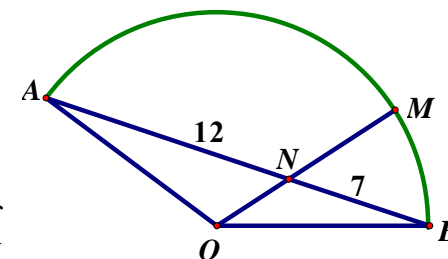
2018 FG7

如圖所示，*A*、*B*、*C*、*D* 及 *E* 為圓上的點。
T 是該圓外的一點。*TA* 是該圓在點 *A* 的切綫，
TBE 及 *TCD* 為直線。已知 *TBE* 是 ∠*ATD* 的
角平分綫、*TA* = 12、*TB* = 6 及 *TC* = 8。
求 Δ*ABE* 與四邊形 *BCDE* 的面積比。
As shown in the figure, *A*, *B*, *C*, *D* and *E* are
points on the circle. *T* is a point outside the circle
such that *TA* is a tangent to the circle at *A* and
TBE and *TCD* are straight lines. It is given that
*TBE* is the angle bisector of ∠*ATD* , *TA* = 12, *TB*
= 6 and *TC* = 8 .
Find the ratio of the area of Δ*ABE* to the area of
quadrilateral *BCDE* .
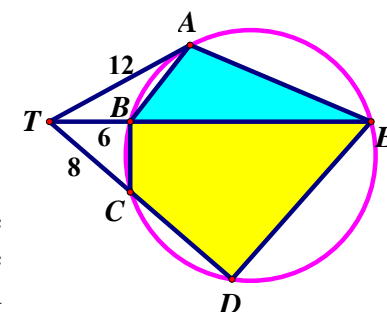
2018 FG1.2

已知兩圓的直徑為 AE 及 BE，內接於直徑為 AB 的圓中。若 $CE \perp AB$，$AB = 10$，$CE = 4$ 及 陰影 部份總面積為 $w\pi$，求 w 的值。

Given that the two circles, one with diameter AE and the other with diameter BE, are inscribed by a larger circle with diameter AB. If $CE \perp AB$ with $AB = 10$ and $CE = 4$, and the total area of the shaded regions is $w\pi$, determine the value of w.
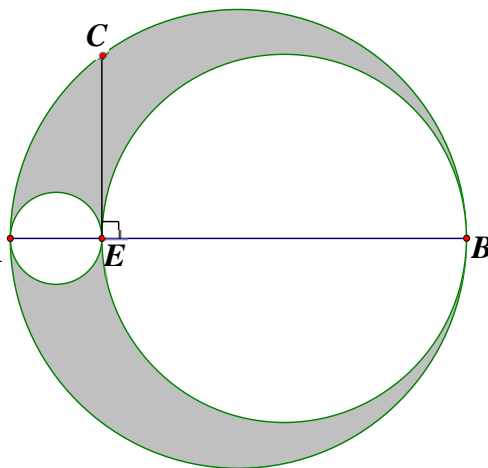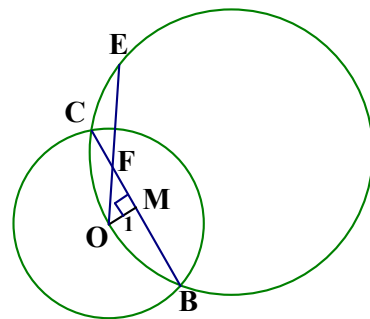
2019 FG4.3

如圖所示，兩圓相交於 B、C 兩點。M 是 BC 的中點。O 在大圓上，使得 $OM \perp BC$。$OM = 1$、$OC = 3$ 及 $OE = 5$。
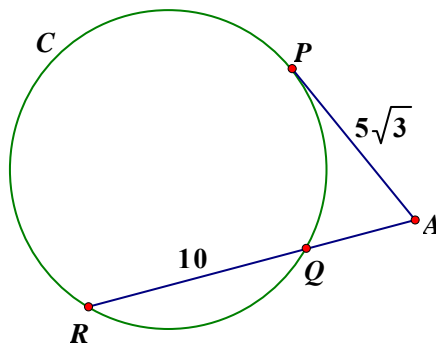
若 $\gamma = OF$，求 γ 的值。

Two circles intersect at B, C as shown in the figure. M is the mid-point of BC. O is a point on the larger circle, so that $OM \perp BC$. $OM = 1$, $OC = 3$ and $OE = 5$.

If $\gamma = OF$, determine the value of γ.

2024 HI15

在圖五中，點 P 及 R 均在圓 C 上。AP 是 C 的切線及 AR 相交於 Q。若 $QR = 10$ 及 $PA = 5\sqrt{3}$，求 AQ 的長。

In Figure 5, P and R are points on the circle C. AP is the tangent to C at P and AR intersects at Q. If $QR = 10$ and $PA = 5\sqrt{3}$, find the length of AQ.

圖五 Figure 5

Answers

1990 HG10 2π	1991 HI18 7	2000 FG1.4 3	2003 FG4.4 $\dfrac{1+\sqrt{5}}{2}$	2008 FG3.1 $\sqrt{33}$
2010 FG4.4 4	2011 FG1.1 2	2015 HI10 $\dfrac{36}{55}$	2015 HG9 $2\sqrt{14}$	2016 HI12 $\dfrac{17}{3}$
2017 HG4 4	2017 HG9 3	2018 HG3 10	2018 FG7 $\dfrac{9}{16}$	2018 FG1.2 8
2019 FG4.3 1.8	2024 HI15 5			