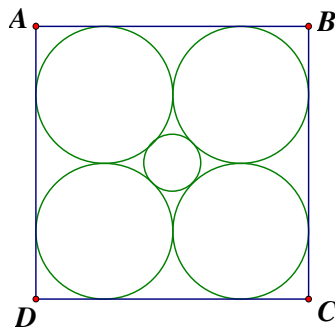**1993 HI3**
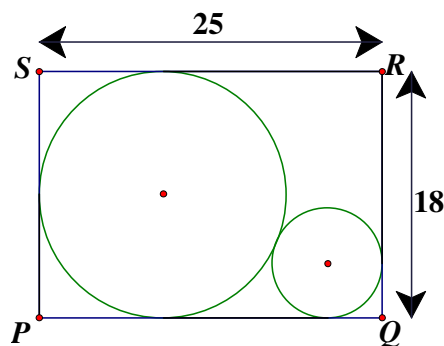
在圖中，*ABCD* 是一邊長為 $8(\sqrt{2}+1)$ 的正方形。

求正方形中央小圓的半徑。

In the figure, *ABCD* is a square of side $8(\sqrt{2}+1)$.
Find the radius of the small circle at the centre of the square.

1993 FI4.3

PQRS 為一長方形，
若細圓的半徑為 *c*，求 *c* 的值。

PQRS is a rectangle. If *c* is the radius of the smaller circle, find the value of *c*.

1995 HG10

在圖中，象限的半徑和大半圓的直徑是 2，求小半圓的半徑。

In the figure, the radius of the quadrant and the diameter of the large semi-circle is 2. Find the radius of the small semi-circle.

1995 FI5.3

如圖示，L_1、L_2 為三個圓的切綫。
如果最大圓的半徑是 18，最小圓半徑是 8，
求 *c* 的值，若 *c* 為圓 *W* 的半徑。

In the figure, L_1 and L_2 are tangents to the three circles. If the radius of the largest circle is 18 and the radius of the smallest circle is 8, find the value of *c*, where *c* is the radius of the circle *W*.

1996 FG8 在本題內，所有不命名的圓皆是單位圓。
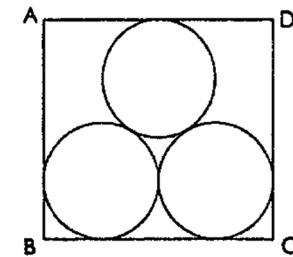   In this question, all unnamed circles are unit circles.
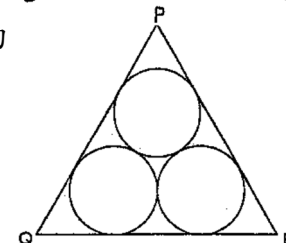
G8.1 若矩形 *ABCD* 的面積是 $a+4\sqrt{3}$，求 *a* 的值。
       If the area of the rectangle *ABCD* is $a+4\sqrt{3}$, find the value of *a*.

G8.2 若等邊三角形 *PQR* 的面積是 $6+b\sqrt{3}$，求 *b* 的值。
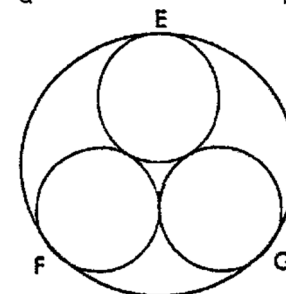   If the area of the equilateral triangle *PQR* is $6+b\sqrt{3}$, find the value of *b*.
       Same as **2021 P1Q5**

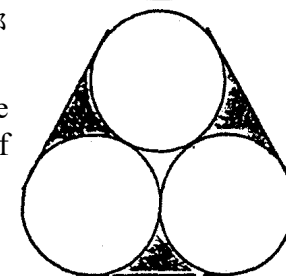**G8.3** 若圓 *EFG* 的面積是 $\dfrac{(c+4\sqrt{3})\pi}{3}$，求 *c* 的值。
       If the area of the circle *EFG* is $\dfrac{(c+4\sqrt{3})\pi}{3}$, find the value of *c*.

G8.4 若下圖所有直綫皆是兩個圓的公切綫，且陰影部份的面積是 $6+d\pi$，求 *d* 的值。
       If all the straight lines in the diagram below are common tangents to the two circles, and the area of the shaded part is $6+d\pi$, find the value of *d*.

1997 HG9

圖中三個半徑為 *r* cm 之全等圓被一三角形緊緊圍著。
若三角形之周界為 $(180+180\sqrt{3})$cm，求 *r* 的值。

In the figure, three identical circles with radius *r* cm are tightly enclosed in a triangle. If the perimeter of the triangle is $(180+180\sqrt{3})$cm, find the value of *r*.
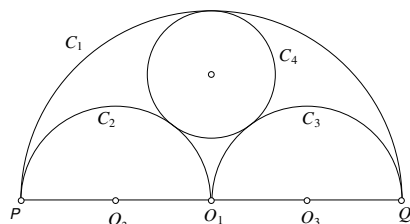
2000 HG7

如圖二，已知三等圓互相外切，且內切於矩形 $PQRS$，求 $\dfrac{QR}{SR}$ 的值。

(取 $\sqrt{3} = 1.7$ 及答案須準確至二個小數位)

In Figure 2, three equal circles are tangent to each other, and inscribed in rectangle $PQRS$, find the value of $\dfrac{QR}{SR}$. (Use $\sqrt{3} = 1.7$ and give the answer correct to 2 decimal places)
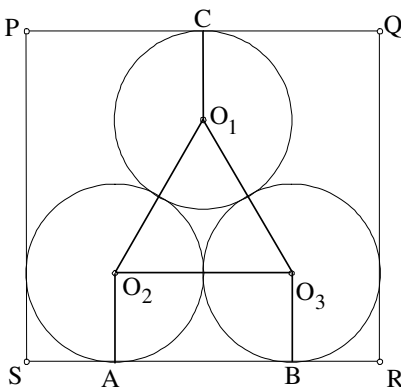
2002 HG8

如圖，PQ、PO_1、O_1Q 分別是以 O_1、O_2、O_3 為圓心的半圓 C_1、C_2、C_3 的直徑，圓 C_4 內切於半圓 C_1 及外切於半圓 C_2、C_3。若 $PQ = 24$，求圓 C_4 的面積 (取 $\pi = 3$)。
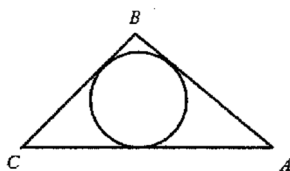
In figure 2, PQ, PO_1, O_1Q are diameters of semi-circles C_1, C_2, C_3 with centres at O_1, O_2, O_3 respectively, and the circle C_4 touches C_1, C_2, and C_3.
If $PQ = 24$, find the area of circle C_4. (Take $\pi = 3$).

2007 FG4.4

如圖一，ΔABC 是一等腰三角形，$AB = BC = 20$ cm 及 $\tan\angle BAC = \dfrac{4}{3}$。若 ΔABC 的內切圓的半徑為 r cm，求 r 的值。
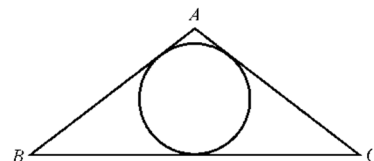
In Figure 1, ΔABC is an isosceles triangle, $AB = BC = 20$ cm and $\tan \angle BAC = \dfrac{4}{3}$.
If the length of radius of the inscribed circle of ΔABC is r cm, find the value of r.

2013 HG8

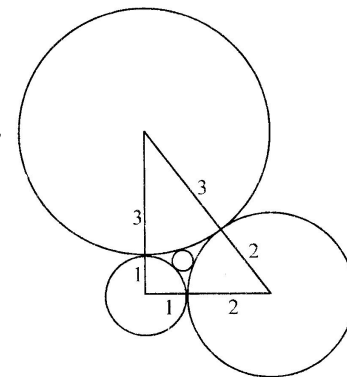圖中，ΔABC 為一等腰三角形，其中 $AB = AC$，$BC = 240$。已知 ΔABC 的內接圓的半徑是 24，求 AB 的長度。

In the figure, ΔABC is an isosceles triangle with $AB = AC$, $BC = 240$.
The radius of the inscribed circle of ΔABC is 24. Find the length of AB.

2015 HG7

四個半徑分別為 1 單位、2 單位、3 單位及 r 單位的圓互相相切如圖所示。求 r 的值。

Four circles with radii 1 unit, 2 units, 3 units and r units are touching one another as shown in the figure.
Find the value of r.

2015 FG1.4

三個半徑分別為 2、3 及 10 單位的圓同時放於另一大圓內，使得四個圓剛好彼此接觸。求大圓的半徑的值。

Three circles of radii 2, 3 and 10 units are placed inside another big circle in such a way that all circles are touching one another.
Determine the value of the radius of the big circle.

2015 FG2.4

在下圖中，四個大小相同的圓形剛好放入一等邊三角形內。若圓的半徑為 1 單位，求三角形的面積的值。

In the figure below, there are 4 identical circles placed inside an equilateral triangle. If the radii of the circles are 1 unit, what is the value of the area of the triangle?
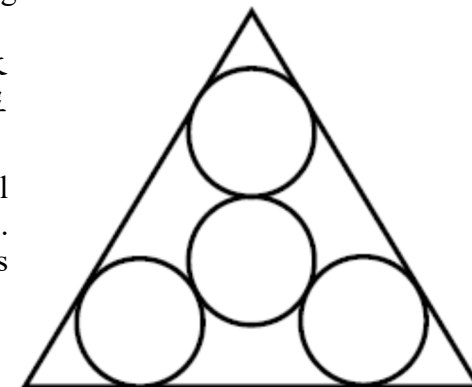
2017 HI13

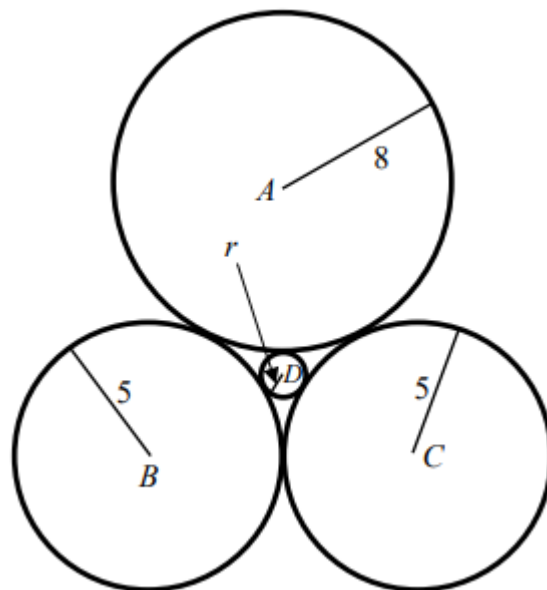如圖，O 是圓 ADB 的圓心。BC 及 CD 分別是圓形在點 B 及 D 的切綫。$OC \parallel AD$，$OA = 15$。若 $AD + OC = 43$，求 CD 的長。

As shown in the figure, O is the centre of the circle ADB. BC and CD are tangents to the circle at points B and D respectively. $OC \parallel AD$, $OA = 15$.
If $AD + OC = 43$, find the length of CD.
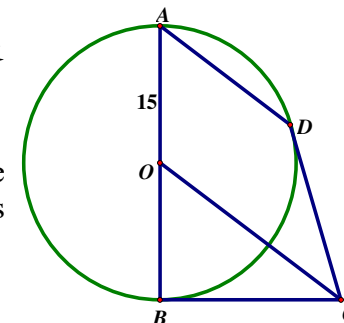
2021 P1Q3

在圖中，四個半徑分別為 8、5、5
及 *r* 的圓互相外切。求 *r* 的值。

In the figure, four circles of radii 8,
5, 5 and *r* are touching each other
externally. Find the value of *r* .

2021 P2Q5

ABCD 是圓形而 *ABE* 及 *CED* 為半圓
形互切於 *E* 在圓內。已知圓面積為 1
cm² 及 *AB // CD*，求半圓形 *ABE* 及
CED 的面積之和。

ABCD is a circle while *ABE* and *CED*
are semi-circles touching each other at
E inside the circle. Given the area of
circle is 1 cm² and *AB // CD* , find the
sum of the area of the semi-circles *ABE*
and *CED* .
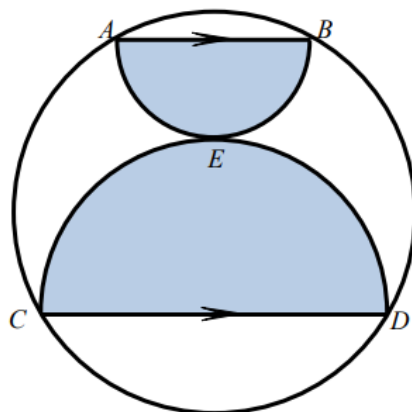
2022 P1Q15

PQR 是一個等腰三角形，其中 *PQ = PR =* 17 and *QR =* 16。將 *I* 及 *H* 分別
記為 *PQR* 的內心及垂心。求 *IH* 長度的值。

PQR is an isosceles triangle with *PQ = PR =* 17 and *QR =* 16 . Denote the in-
centre and the orthocentre of *PQR* by *I* and *H* respectively. Find the length of *HI* .

Answers

1993 HI3 2	1993 FI4.3 4	1995 HG10 $\dfrac{2}{3}$	1995 FI5.3 12	1996 FG8.1 8
1996 FG8.2, 2021 P1Q5 4	1996 FG8.3 7	1996 FG8.4 $-\dfrac{3}{2}$	1997 HG9 30	2000 HG7 0.93
2002 HG8 48	2007 FG4.4 6	2013 HG8 130	2015 HG7 $\dfrac{6}{23}$	2015 FG1.4 15
2015 FG2.4 $12\sqrt{3}$	2017 HI13 20 or $3\sqrt{11}$	2021 P2Q3 $\dfrac{8}{9}$	2021 P2Q5 $\dfrac{1}{2}$	2022 P1Q15 $\dfrac{8}{15}$