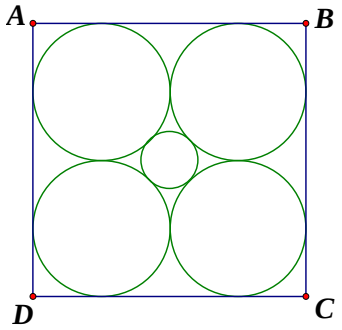
1993 HI3

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。

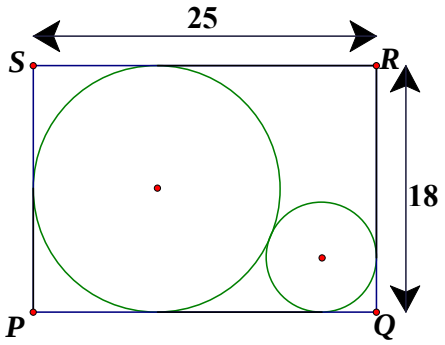
In the figure, *ABCD* is a square of side $8(\sqrt{2}+1)$. Find the radius of the small circle at the centre of the square.



1993 FI4.3

PQRS 為一長方形，若細圓的半徑為 *c*，求 *c* 的值。

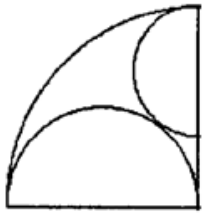
PQRS is a rectangle. If *c* is the radius of the smaller circle, find the value of *c* .



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* .

L_1

W

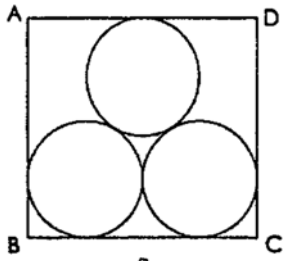
L_2

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.

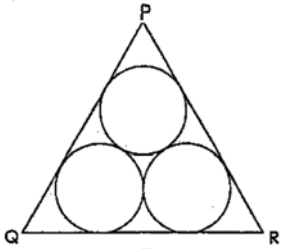
G8.1 若矩形 *ABCD* 的面積是 $a+4\sqrt{3}$，求 *a* 的值。

If the area of the rectangle *ABCD* is $a+4\sqrt{3}$, find the value of *a* .



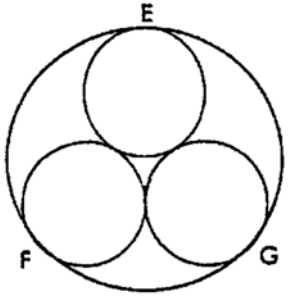
G8.2 若等邊三角形 *PQR* 的面積是 $6+b\sqrt{3}$，求 *b* 的值。

If the area of the equilateral triangle *PQR* is $6+b\sqrt{3}$, find the value of *b* .



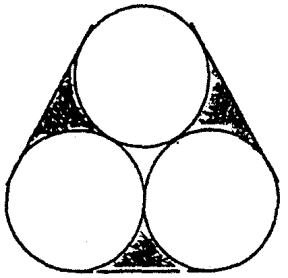
G8.3 若圓 *EFG* 的面積是 $\frac{(c+4\sqrt{3})\pi}{3}$，求 *c* 的值。

If the area of the circle *EFG* is $\frac{(c+4\sqrt{3})\pi}{3}$, 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

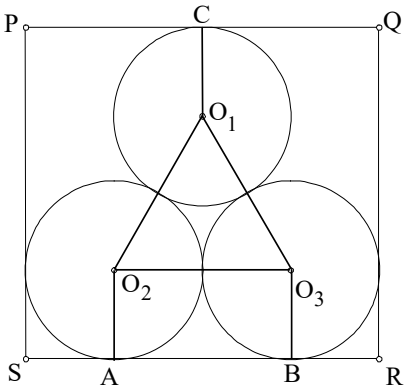
圖中三個半徑為 *r* cm 之全等圓被一三角形緊緊圍著。若三角形之周界為 $(180+180\sqrt{3})$cm，求 *r* 的值。

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 $\frac{QR}{SR}$ 的值。

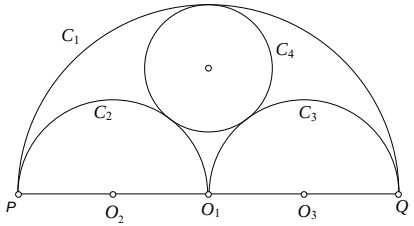
(取 $\sqrt{3}=1.7$ 及答案須準確至二個小數位)



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

2002 HG8

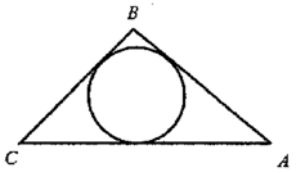
如圖，PQ、PO_1、O_1Q 分別是以 O_1、O_2、O_3 為圓心的半圓 C_1、C_2、C_3 的直徑，圓 C_4 內切於半圓 C_1 及外切於半圓 C_2、C_3。若 $PQ=24$，求圓 C_4 的面積 (取 $\pi=3$)。



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

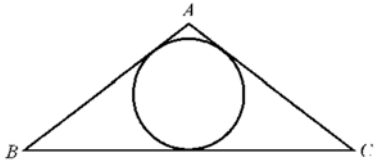
如圖一，ΔABC 是一等腰三角形，$AB=BC=20$ cm 及 $\tan\angle BAC=\frac{4}{3}$。若 ΔABC 的內切圓的半徑為 r cm，求 r 的值。



In Figure 1, ΔABC is an isosceles triangle, $AB = BC = 20$ cm and $\tan\angle BAC = \frac{4}{3}$.
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。

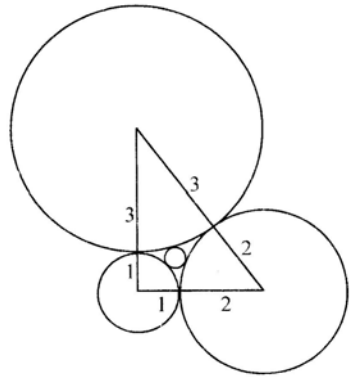


In the figure, ΔABC is an isosceles triangle with $AB = AC$, $BC = 240$.
The radius of the inscribed circle of ΔABC is 24. Find the length of AB .

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

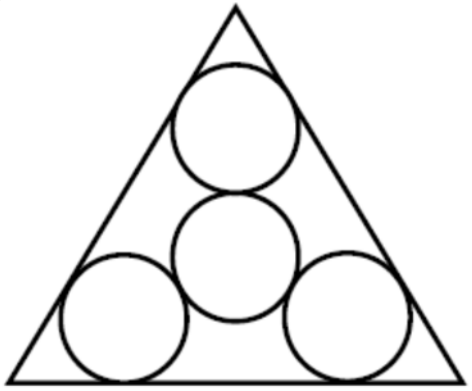
三個半徑分別為 2、3 及 10 單位的圓同時放於另一大圓內，使得四個圓剛好彼此接觸。求大圓的半徑的值。

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。

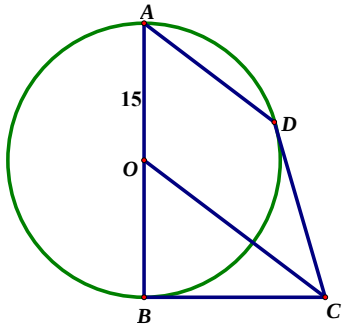
In the figure below, there are 4 identical circles placed inside an equilateral triangle. If the radii of the circles are 1 unit, what is the value of the area of the triangle?



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 // 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 // AD, $OA = 15$.
If $AD + OC = 43$, find the length of CD .

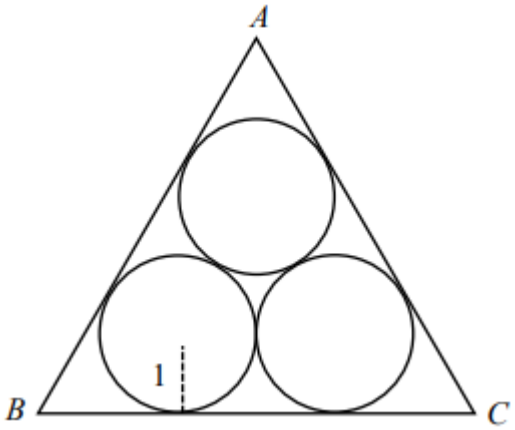


2021 P1Q5

在圖一中，三個單位圓位於一等邊三角形 ABC 內，使得每個圓均與另外兩圓及三角形的兩邊相切。

求 ΔABC 的面積。

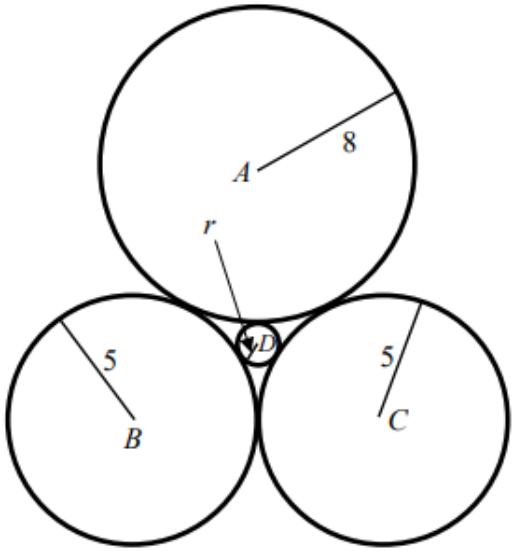
In Figure 1, three unit circles are placed inside an equilateral triangle ABC such that any circle is tangential to two sides of the triangle and to the other two circles. Find the area of ΔABC.



2021 P2Q3

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。

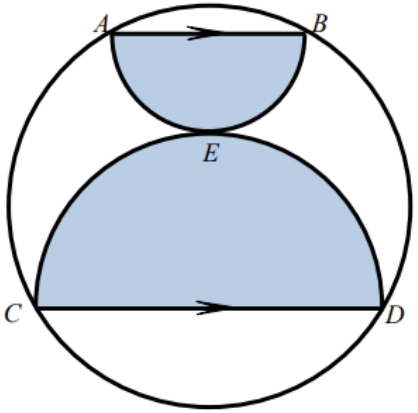
In the figure, four circles of radii 8, 5, 5 and r are touching each other externally. Find the value of r.



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 cm^2 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 cm^2 and AB // CD, find the sum of the area of the semi-circles ABE and CED.



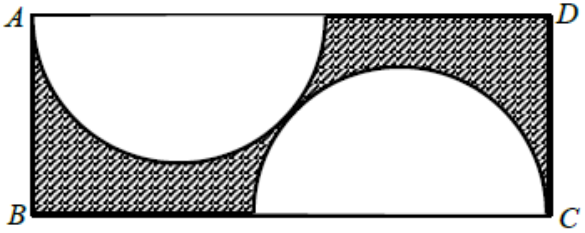
2022 P1Q15

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.

2023 FG3.4

右圖中，$ABCD$ 是一個長方形。兩個半圓形完全相等且它們彼此相切。如果 $AB = 2$ 及 $BC = 6$，求圖中陰影面積（答案以 π 表示）。

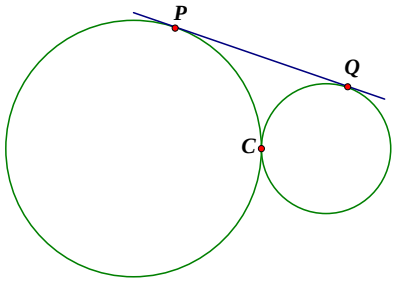


In the following figure, $ABCD$ is a rectangle. The two semi-circles are identical and they are tangent to each other. If $AB = 2$ and $BC = 6$, find the area of the shaded part in terms of π.

2024 HI7

如圖一所示，一條公切線與一大圓及一小圓分別相交於點 P 及 Q。已知該兩圓相交於點 C 且它們的半徑分別為 49 及 25，求 PQ 的長。

As shown in Figure 1, a common tangent touches a large circle and a small circle at P and Q respectively. Given that the two circles touch each other at C and their radii are 49 and 25 respectively, find the length of PQ.



圖一 Figure 1

Answers

1993 HI3 2	1993 FI4.3 4	1995 HG10 $\frac{2}{3}$	1995 FI5.3 12	1996 FG8.1 8
1996 FG8.2, 2021 P1Q5 4	1996 FG8.3 7	1996 FG8.4 $-\frac{3}{2}$	1997 HG9 30	2000 HG7 0.93
2002 HG8 48	2007 FG4.4 6	2013 HG8 130	2015 HG7 $\frac{6}{23}$	2015 FG1.4 15
2015 FG2.4 $12\sqrt{3}$	2017 HI13 20 or $3\sqrt{11}$	2021 P1Q5 $6+4\sqrt{3}$	2021 P2Q3 $\frac{8}{9}$	2021 P2Q5 $\frac{1}{2}$
2022 P1Q15 $\frac{8}{15}$	2023 FG3.4 $12-\frac{25\pi}{9}$	2024 HI7 70		