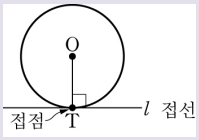
◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시
1) 제작연월일 : 2016-10-25
2) 제작자 : 교육지대㈜
3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초 제작일부터 5년간 보호됩니다.

◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법 외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

계산시 참고사항

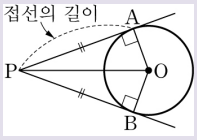
1. 원의 접선

1) 접선: 원과 한 점에서 만나는 직선을 접선이라고 하고, 이때 만나는 점을 접점이라고 한다.
2) 원의 접선과 그 접점을 지나는 원의 반지름은 서로 수직이다.



2. 원의 접선의 길이

1) 접선의 길이: 원 O밖의 한 점 P에서 이 원에 그을 수 있는 접선은 2개이고, 접점을 각각 A, B라 하면 $\overline{PA}$, $\overline{PB}$의 길이가 점 P에서 원 O에 그은 접선의 길이이다.

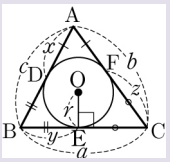


2) 원의 접선의 성질: 원 밖의 한 점에서 그 원에 그은 두 접선의 길이는 같다.
⇨ $\overline{PA}=\overline{PB}$

3. 삼각형의 내접원

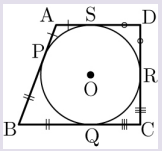
원 O가 삼각형 ABC에 내접하고 내접원의 반지름의 길이가 r일 때

1) $\overline{AD}=\overline{AF}$, $\overline{BD}=\overline{BE}$, $\overline{CE}=\overline{CF}$
2) △ABC의 둘레의 길이: $a+b+c=2(x+y+z)$
3) △ABC의 넓이: $\frac{1}{2}\times r\times(a+b+c)$



4. 외접사각형의 성질

1) 원에 외접하는 사각형의 두 쌍의 대변의 길이의 합은 서로 같다.
⇨ $\overline{AB}+\overline{CD}=\overline{AD}+\overline{BC}$
2) 두 쌍의 대변의 길이의 합이 서로 같은 사각형은 원에 외접한다.



참고 원의 접선의 길이의 설명
◉ △PAO와 △PBO에서
$\angle PAO=\angle PBO=90^\circ$,
$\overline{OA}=\overline{OB}$(원의 반지름),
$\overline{OP}$는 공통이므로
△PAO ≡ △PBO (RHS 합동)
따라서 $\overline{PA}=\overline{PB}$이다.

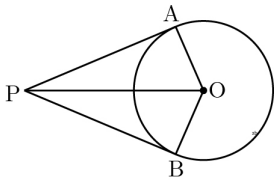
참고
◉ $\angle APB+\angle AOB=180^\circ$

참고
◉(△ABC의 넓이)
$=\triangle ABO+\triangle BCO+\triangle CAO$
$=\frac{1}{2}cr+\frac{1}{2}ar+\frac{1}{2}br=\frac{1}{2}r(a+b+c)$

외접사각형의 성질에서
◉ $\overline{AB}+\overline{CD}$
$=(\overline{AP}+\overline{BP})+(\overline{CR}+\overline{DR})$
$=(\overline{AS}+\overline{BQ})+(\overline{CQ}+\overline{DS})$
$=(\overline{AS}+\overline{DS})+(\overline{BQ}+\overline{CQ})$
$=\overline{AD}+\overline{BC}$

원의 접선

다음 그림에서 두 직선 PA, PB는 원 O의 접점이고, 점 A, B는 접점일 때, 다음 중 옳은 것에는 ○표, 옳지 않은 것에는 ×표 하여라.

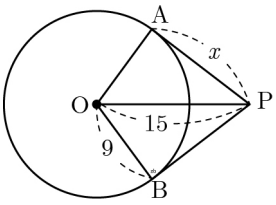


1. $\overline{PB}=\overline{PO}$ ( )
2. $\angle PAO=90^\circ$ ( )
3. $\angle APO\neq\angle BPO$ ( )
4. $\overline{PA}^2=\overline{PO}^2-\overline{OA}^2$ ( )
5. $\triangle APO\equiv\triangle BPO$ ( )

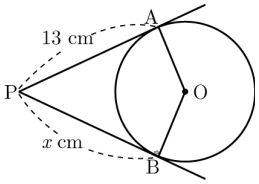
족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

◪ 다음 그림에서 $\overline{PA}, \overline{PB}$는 원 O의 접선이고, 두 점 A, B는 접점일 때, x의 값을 구하여라.

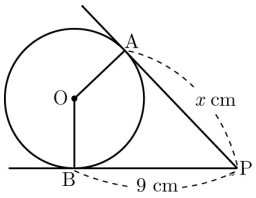
6.



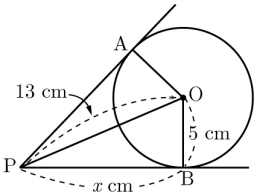
7.



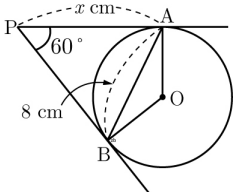
8.



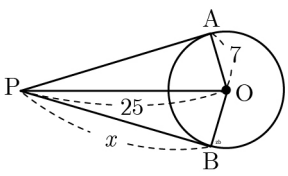
9.



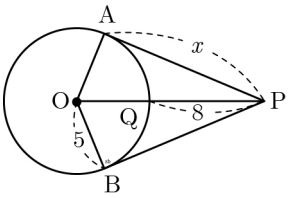
10.



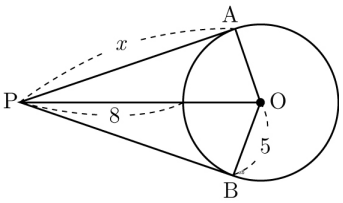
11.



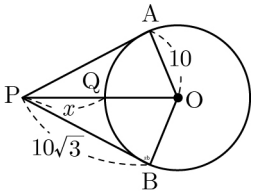
12.



13.

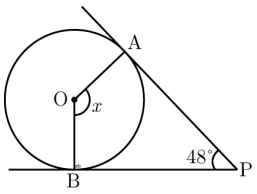


14.

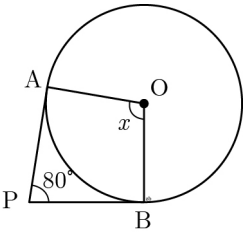


◪ 다음 그림에서 $\overline{PA}, \overline{PB}$는 원 O의 접선이고, 두 점 A, B는 접점일 때, $\angle x$의 크기를 구하여라.

15.

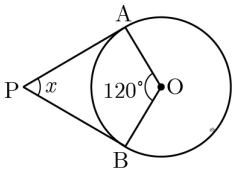


16.

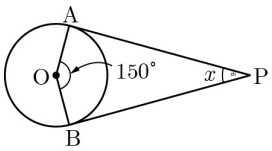


Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

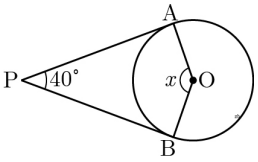
17.



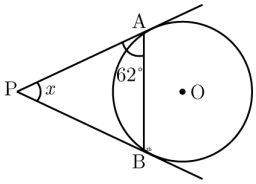
18.



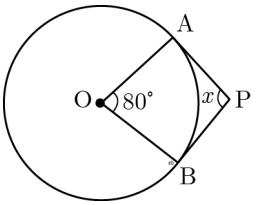
19.



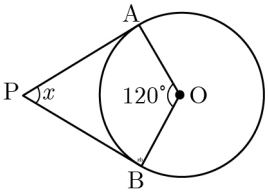
20.



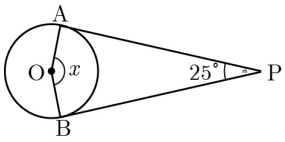
21.



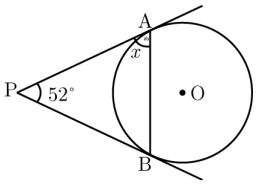
22.



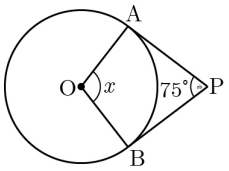
23.



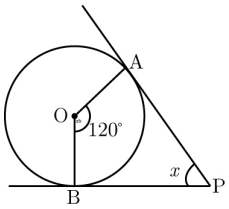
24.



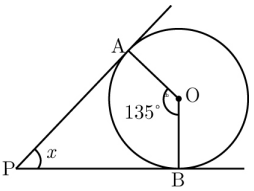
25.



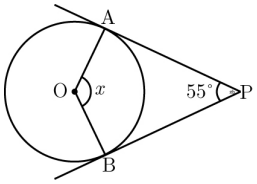
26.



27.

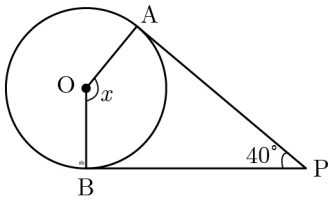


28.



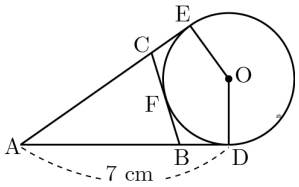
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

29.

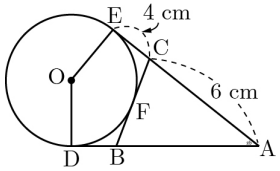


◪ 다음 그림에서 세 직선 AD, AE, BC는 원 O의 접선이고 점 D, E, F는 접점일 때, △ABC의 둘레의 길이를 구하여라.

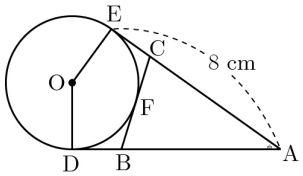
30.



31.

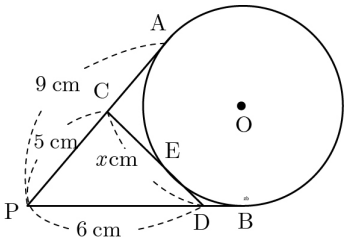


32.

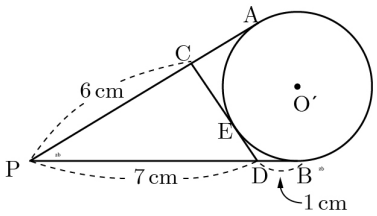


◪ 다음 물음에 답하여라.

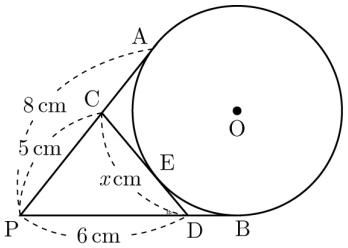
33. 다음 그림에서 $\overline{PA}$, $\overline{PB}$, $\overline{CD}$는 원 O의 접선이고 점 E는 원 O의 접점일 때, x의 값을 구하여라.



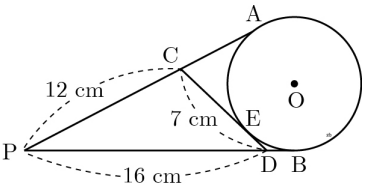
34. 다음 그림에서 $\overline{PA}$, $\overline{PB}$, $\overline{CD}$는 원 O의 접선이고 점 E는 원 O의 접점이다. $\overline{PC}=6\text{cm}$, $\overline{PD}=7\text{cm}$, $\overline{DB}=1\text{cm}$일 때, $\overline{CD}$의 길이를 구하여라.



35. $\overline{PA}$, $\overline{PB}$, $\overline{CD}$는 원 O의 접선이고 점 E는 원 O의 접점일 때, x의 값을 구하여라.



36. 다음 그림에서 $\overline{PA}$, $\overline{PB}$, $\overline{CD}$는 원 O의 접선이고, 점 E는 원 O의 접점이다. $\overline{PC}=12\text{cm}$, $\overline{PD}=16\text{cm}$, $\overline{CD}=7\text{cm}$일 때, $\overline{AC}$의 길이를 구하여라.

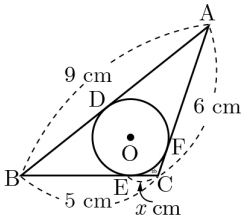


족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

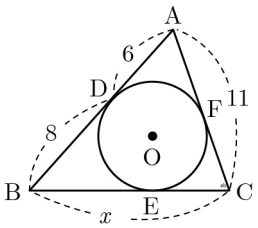
삼각형의 내접원

◪ 다음 그림에서 원 O는 △ABC의 내접원이고 점 D, E, F는 접점일 때, x의 값을 구하여라.

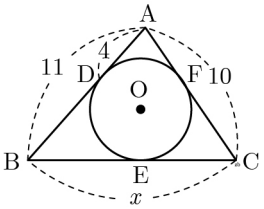
37.



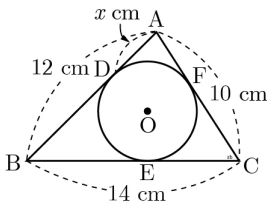
38.



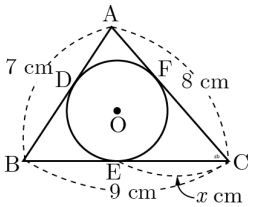
39.



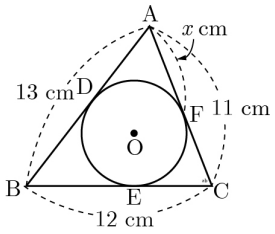
40.



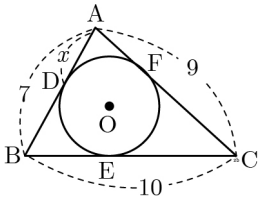
41.



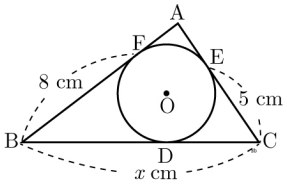
42.



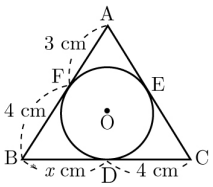
43.



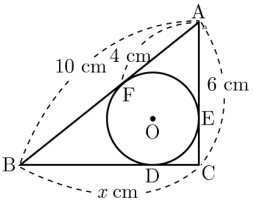
44.



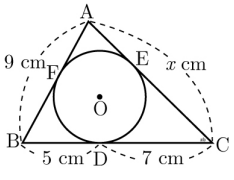
45.



46.

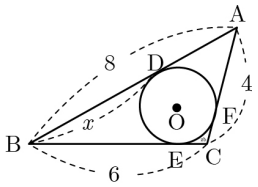


47.



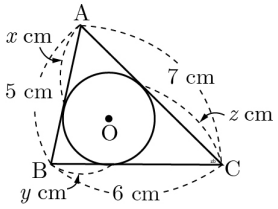
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

48.

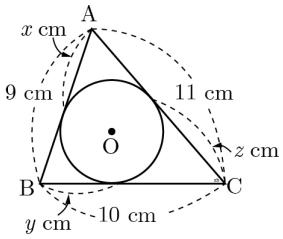


◪ **다음 그림에서 원 O가 △ABC에 내접할 때, $x+y+z$의 값을 구하여라.**

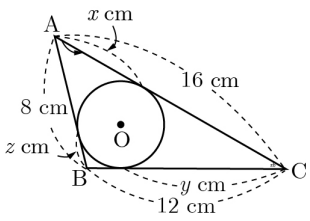
49.



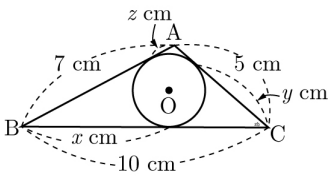
50.



51.

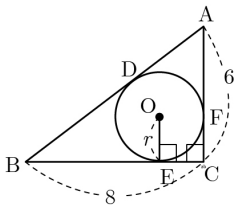


52.

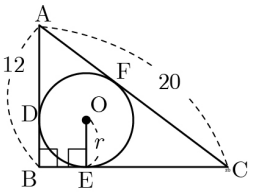


◪ **다음 그림에서 원 O는 직각삼각형 ABC의 내접원이고 점 D, E, F는 접점일 때, r의 값을 구하여라.**

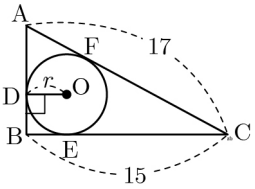
53.



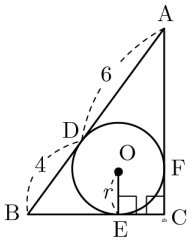
54.



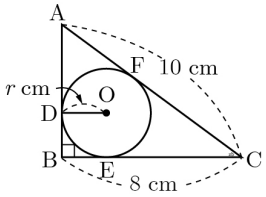
55.



56.

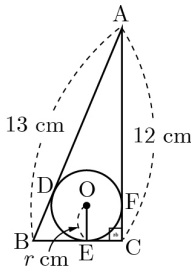


57.

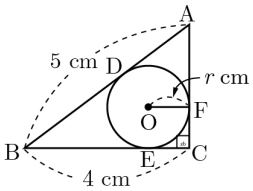


Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

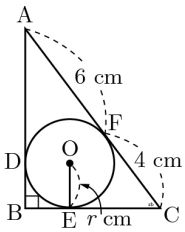
58.



59.

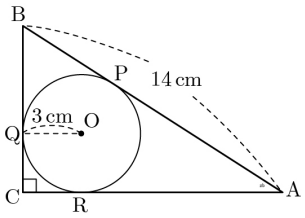


60.

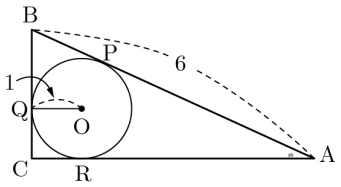


◪ **원 O는 △ABC의 내접원이고, 점 P, Q, R은 각각 △ABC의 세 변과 원 O의 접점일 때, △ABC의 넓이를 구하여라.**

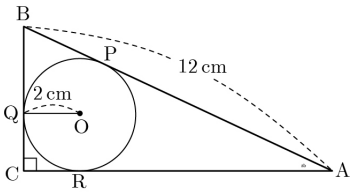
61.



62.

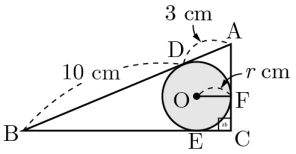


63.

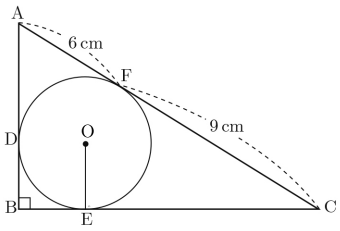


◪ **다음 그림에서 원 O가 △ABC에 내접할 때, 원 O의 넓이를 구하여라.**

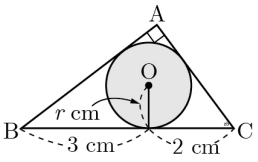
64.



65.



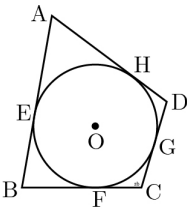
66.



Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

외접사각형의 성질

◪ 다음 그림에서 □ABCD는 원 O에 외접하는 사각형일 때, 다음 중 옳은 것에는 ○표, 옳지 않은 것에는 ×표 하여라.



67. $\overline{AH}=\overline{DH}$ ( )

68. $\overline{BE}=\overline{BF}$ ( )

69. $\overline{AD}=\overline{CD}$ ( )

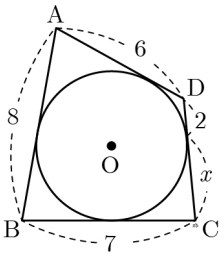
70. $\overline{AB}=\overline{CD}$ ( )

71. $\overline{AB}+\overline{AD}=\overline{BD}+\overline{CD}$ ( )

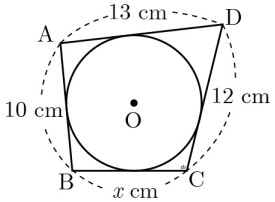
72. $\overline{AB}+\overline{DC}=\overline{AD}+\overline{BC}$ ( )

◪ 다음 그림에서 □ABCD가 원 O에 외접할 때, x의 값을 구하여라.

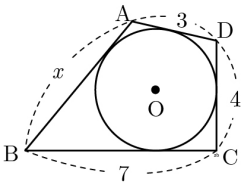
73.



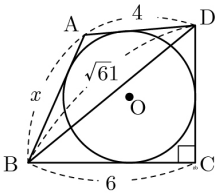
74.



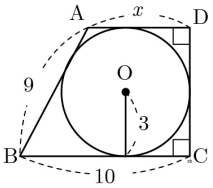
75.



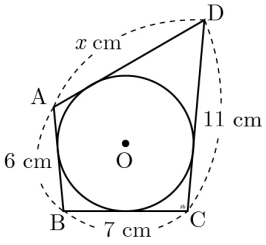
76.



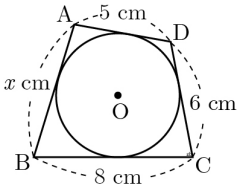
77.



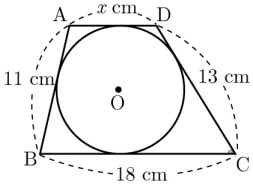
78.



79.

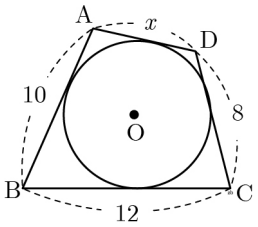


80.

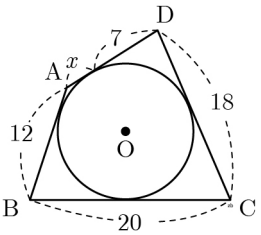


족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

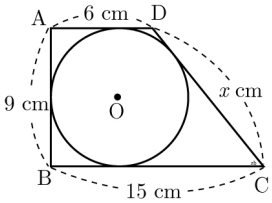
81.



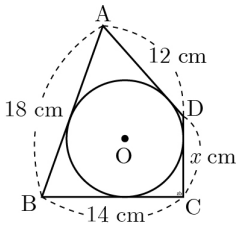
82.



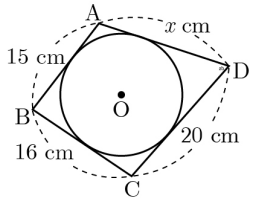
83.



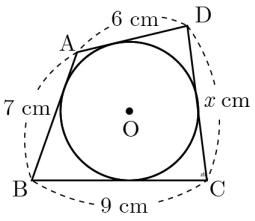
84.



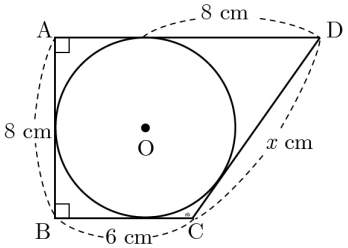
85.



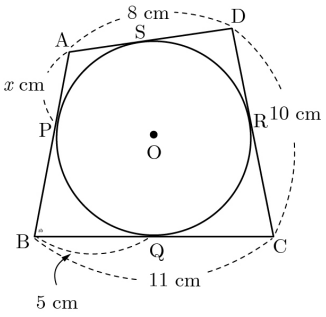
86.



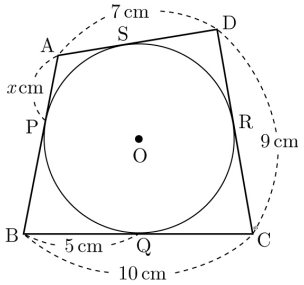
87.



88.



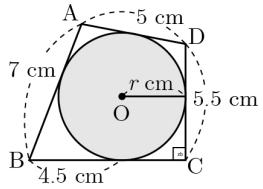
89.



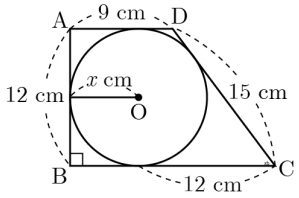
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

◪ **다음 그림에서 원 O에 외접하는 □ABCD에서 ∠C = 90°일 때, 원 O의 넓이를 구하여라.**

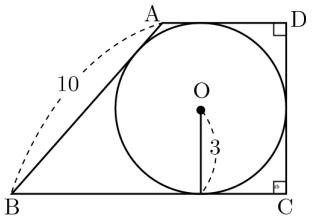
90.



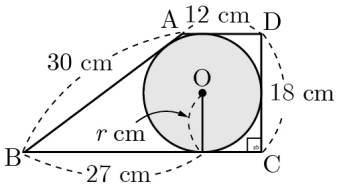
91.



92.



93.



Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

정답 및 해설

1) ×
⇨ $\overline{PA}=\overline{PB}$

2) ○

3) ×
⇨ $\angle APO=\angle BPO$

4) ○

5) ○

6) 12
⇨ 직각삼각형 PBO에서 $\overline{PB}=\sqrt{15^2-9^2}=12$
이때 $\overline{PA}=\overline{PB}$이므로 $x=12$

7) 13

8) 9

9) 12

10) 8
⇨ $\overline{PA}=\overline{PB}$이고, $\angle P=60^\circ$이므로 △PAB는 정삼각형이다.
$\therefore x=8$

11) 24
⇨ 직각삼각형 PAO에서 $\overline{PA}=\sqrt{25^2-7^2}=24$
이때 $\overline{PA}=\overline{PB}$이므로 $x=24$

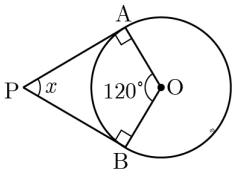
12) 12
⇨ $\overline{OQ}=\overline{OB}=5$이므로 $\overline{OP}=\overline{OQ}+\overline{QP}=5+8=13$
이때 직각삼각형 PBO에서 $\overline{PB}=\sqrt{13^2-5^2}=12$
따라서 $\overline{PA}=\overline{PB}$이므로 $x=12$

13) 12
⇨ $\overline{PO}=8+5=13$이 되어서
△PAO에서 $x=\sqrt{13^2-5^2}=\sqrt{169-25}=\sqrt{144}=12$

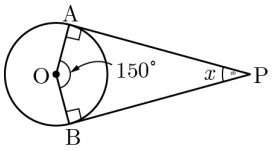
14) 10
⇨ $\overline{PA}=\overline{PB}=10\sqrt{3}$이고, $\overline{OQ}=\overline{OA}=10$이므로
$\overline{PO}=x+10$
이때 직각삼각형 PAO에서
$(x+10)^2=(10\sqrt{3})^2+10^2$
$x^2+20x-300=0$
$(x+30)(x-10)=0$
$\therefore x=10(\because x>0)$

15) 132°
⇨ $\angle x=180^\circ-48^\circ=132^\circ$

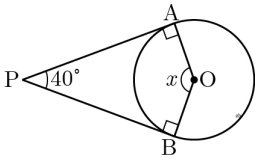
16) 100°
⇨ $\angle PAO=\angle PBO=90^\circ$이므로
$\angle x=360^\circ-(90^\circ+90^\circ+80^\circ)=100^\circ$

17) 60°
⇨ 

$\angle OAP=\angle OBP=90^\circ$
$\therefore \angle x=360^\circ-(90^\circ+90^\circ+120^\circ)=60^\circ$

18) 30°
⇨ 

$\angle OAP=\angle OBP=90^\circ$
$\therefore \angle x=360^\circ-(90^\circ+90^\circ+150^\circ)=30^\circ$

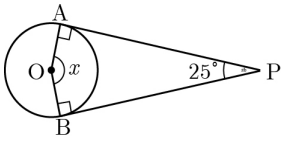
19) 140°
⇨ 

$\angle OAP=\angle OBP=90^\circ$
$\therefore \angle x=360^\circ-(90^\circ+90^\circ+40^\circ)=140^\circ$

20) 56°
⇨ $\angle x=180^\circ-62^\circ\times 2=56^\circ$

21) 100°
⇨ $\angle x=360^\circ-(90^\circ+90^\circ+80^\circ)=100^\circ$

22) 60°
⇨ $\angle x=360^\circ-(90^\circ+90^\circ+120^\circ)=60^\circ$

23) 155°
⇨ 

$\angle OAP=\angle OBP=90^\circ$
$\therefore \angle x=360^\circ-(90^\circ+90^\circ+25^\circ)=155^\circ$

24) 64°

족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

⇨ $\angle x=\frac{1}{2}\times(180^\circ-52^\circ)=64^\circ$

25) 105°

⇨ $\angle OAP=\angle OBP=90^\circ$

$\therefore \angle x=360^\circ-(90^\circ+90^\circ+75^\circ)=105^\circ$

26) 60°

⇨ $\angle x=180^\circ-120^\circ=60^\circ$

27) 45°

⇨ $\angle x=180^\circ-135^\circ=45^\circ$

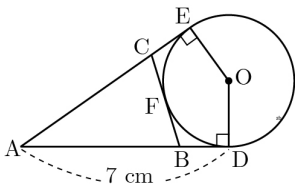
28) 125°

⇨ $\angle x=180^\circ-55^\circ=125^\circ$

29) 140°

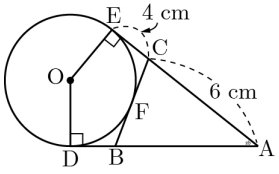
⇨ $\angle x=360^\circ-(90^\circ+90^\circ+40^\circ)=140^\circ$

30) 14 cm

⇨ 

(△ABC의 둘레의 길이)$=2\overline{AD}=2\times7=14(\text{cm})$

31) $20cm$

⇨ 

(△ABC의 둘레의 길이)$=2\overline{AE}=2\times(4+6)=20(\text{cm})$

32) $16cm$

⇨ (△ABC의 둘레의길이)$=2\overline{AE}=2\times8=16(\text{cm})$

33) 7

⇨ $\overline{CE}=\overline{CA}=9-5=4(\text{cm})$, $\overline{DB}=\overline{DE}=9-6=3(\text{cm})$

$\overline{CD}=\overline{CE}+\overline{DE}$ $\therefore\ x=4+3=7$

34) 3cm

⇨ $\overline{PA}=\overline{PB}=7+1=8(\text{cm})$, $\overline{CA}=\overline{CE}=8-6=2(\text{cm})$

$\overline{DE}=\overline{DB}=1(\text{cm})$

$\therefore\ \overline{CD}=\overline{CE}+\overline{DE}=2+1=3(\text{cm})$

35) 5

⇨ $\overline{PA}=\overline{PB}=8(\text{cm})$이므로

$\overline{AC}=8-5=3(\text{cm})$, $\overline{BD}=8-6=2(\text{cm})$

$\therefore\ x=\overline{CE}+\overline{DE}=\overline{AC}+\overline{DB}=3+2=5(\text{cm})$

36) 5.5 cm

⇨ $\overline{AC}=\overline{CE}=x$, $\overline{DE}=\overline{DB}=y$라고 하자.

$\overline{PA}=\overline{PB}$, $12+x=16+y$, $x-y=4$ …①

$\overline{CD}=x+y=7$ …②

①+②를 하면 $2x=11$ $\therefore\ x=\frac{11}{2}=5.5$

따라서 $\overline{AC}$의 길이는 5.5 cm이다.

37) 1

⇨ $\overline{BD}=\overline{BE}=(5-x)\text{cm}$, $\overline{AD}=\overline{AF}=(6-x)\text{cm}$이므로

$(5-x)+(6-x)=9$ $\therefore\ x=1$

38) 13

⇨ $\overline{BE}=\overline{BD}=8$, $\overline{AF}=\overline{AD}=6$이므로

$\overline{CE}=\overline{CF}=11-6=5$

$\overline{BC}=\overline{BE}+\overline{CE}$이므로 $x=8+5=13$

39) 13

⇨ $\overline{BE}=\overline{BD}=11-4=7$, $\overline{AF}=\overline{AD}=4$이므로

$\overline{CE}=\overline{CF}=10-4=6$

$\overline{BC}=\overline{BE}+\overline{CE}$이므로 $x=7+6=13$

40) 4

⇨ $\overline{BE}=\overline{BD}=(12-x)\text{cm}$,

$\overline{AD}=\overline{AF}$이므로 $\overline{CE}=\overline{CF}=(10-x)\text{cm}$

$(12-x)+(10-x)=14$

$22-2x=14$ $\therefore\ x=4$

41) 5

⇨ $\overline{BD}=\overline{BE}=(9-x)\text{cm}$, $\overline{AD}=\overline{AF}=(8-x)\text{cm}$

$(9-x)+(8-x)=7$ $\therefore\ x=5$

42) 6

⇨ $\overline{BE}=\overline{BD}=(13-x)\text{cm}$, $\overline{CE}=\overline{CF}=(11-x)\text{cm}$

$(13-x)+(11-x)=12$ $\therefore\ x=6$

43) 3

⇨ $\overline{AF}=\overline{AD}=x$, $\overline{BE}=\overline{BD}=7-x$, $\overline{CE}=\overline{CF}=9-x$

$\overline{BC}=\overline{BE}+\overline{CE}$이므로

$10=(7-x)+(9-x)$ $\therefore x=3$

44) 13

⇨ $\overline{BC}=\overline{BF}+\overline{CE}=8+5=13(\text{cm})$

45) 4

⇨ $\overline{BD}=\overline{BF}=4(\text{cm})$

46) 8

⇨ $\overline{BD}=\overline{BF}=10-4=6(\text{cm})$

$\overline{CD}=\overline{CE}=6-4=2(\text{cm})$

$\therefore\ \overline{BC}=\overline{BD}+\overline{CD}=6+2=8(\text{cm})$

족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

47) 11

⇨ $\overline{AE}=\overline{AF}=9-5=4(\text{cm})$, $\overline{CE}=\overline{CD}=7(\text{cm})$

$\therefore\ \overline{AC}=\overline{AE}+\overline{CE}=4+7=11(\text{cm})$

48) 5

⇨ $\overline{BE}=\overline{BD}=x$, $\overline{AF}=\overline{AD}=8-x$, $\overline{CF}=\overline{CE}=6-x$

$\overline{AC}=\overline{AF}+\overline{CF}$이므로

$4=(8-x)+(6-x)$ $\therefore x=5$

49) 9

⇨ $x+y+z=\frac{1}{2}(\overline{AB}+\overline{BC}+\overline{CA})=\frac{1}{2}(5+6+7)=9$

50) 15

⇨ $x+y+z=\frac{1}{2}(9+10+11)=15$

51) 18

⇨ $x+y+z=\frac{1}{2}(8+12+16)=18$

52) 11

⇨ $x+y+z=\frac{1}{2}(7+10+5)=11$

53) 2

⇨ $\triangle ABC$에서 $\overline{AB}=\sqrt{8^2+6^2}=10$

$\overline{CE}=\overline{CF}=r$이므로

$\overline{AD}=\overline{AF}=6-r$, $\overline{BD}=\overline{BE}=8-r$

$\overline{AB}=\overline{AD}+\overline{BD}$이므로

$10=(6-r)+(8-r)$, $2r=4$ $\therefore r=2$

54) 4

⇨ $\triangle ABC$에서 $\overline{BC}=\sqrt{20^2-12^2}=16$

$\overline{BD}=\overline{BE}=r$이므로

$\overline{AF}=\overline{AD}=12-r$, $\overline{CF}=\overline{CE}=16-r$

$\overline{AC}=\overline{AF}+\overline{CF}$이므로

$20=(12-r)+(16-r)$, $2r=8$ $\therefore r=4$

55) 3

⇨ $\triangle ABC$에서 $\overline{AB}=\sqrt{17^2-15^2}=8$

$\overline{BD}=\overline{BE}=r$이므로

$\overline{AF}=\overline{AD}=8-r$, $\overline{CF}=\overline{CE}=15-r$

$\overline{AC}=\overline{AF}+\overline{CF}$이므로

$17=(8-r)+(15-r)$, $2r=6$ $\therefore r=3$

56) 2

⇨ $\overline{CE}=\overline{CF}=r$, $\overline{AF}=\overline{AD}=6$, $\overline{BE}=\overline{BD}=4$이므

$\overline{AC}=\overline{AF}+\overline{CF}=6+r$, $\overline{BC}=\overline{BE}+\overline{CE}=4+r$

$\triangle ABC$에서 $10^2=(6+r)^2+(4+r)^2$

$r^2+10r-24=0$, $(r+12)(r-2)=0$

$\therefore r=2(\because r>0)$

57) 2

⇨ $\overline{AB}=\sqrt{10^2-8^2}=6(\text{cm})$

$\angle B=90^\circ$인 직각삼각형 ABC의 내접원 O에 대하여 □DBEO는 정사각형이다.

$\overline{EO}+\overline{DO}=r\text{cm}$, $\overline{AF}=\overline{AD}=(6-r)\text{cm}$

$\overline{CF}=\overline{CE}=(8-r)\text{cm}$이므로

$(6-r)+(8-r)=10$ $\therefore\ r=2$

58) 2

⇨ $\overline{BC}=\sqrt{13^2-12^2}=5(\text{cm})$

$\overline{AD}=\overline{AF}=(12-r)\text{cm}$, $\overline{BD}=\overline{BE}=(5-r)\text{cm}$이므로

$(12-r)+(5-r)=13$ $\therefore\ r=2$

59) 1

⇨ $\overline{AC}=\sqrt{5^2-4^2}=3(\text{cm})$, $\overline{AD}=\overline{AF}=(3-r)\text{cm}$

$\overline{BD}=\overline{BE}=(4-r)\text{cm}$이므로

$(3-r)+(4-r)=5$ $\therefore\ r=1$

60) 2

⇨ $\overline{AB}=(6+r)\text{cm}$, $\overline{BC}=(4+r)\text{cm}$에서

$(6+r)^2+(4+r)^2=10^2$

$r^2+10r-24=0$ $\therefore\ r=2(r>0)$

61) 51cm^2

⇨ 접선의 성질에 의해 $\overline{BQ}=\overline{BP}=x$, $\overline{AR}=\overline{AP}=y$라 하면

$\overline{AB}=x+y=14$ …①

원의 반지름의 길이는 3cm이고, $\overline{BC}=x+3$, $\overline{AC}=y+3$

$\triangle ABC=\triangle BOC+\triangle AOC+\triangle AOB$

$=\frac{1}{2}\times3\times(x+3)+\frac{1}{2}\times3\times(y+3)+\frac{1}{2}\times3\times14$

$=\frac{3}{2}\times(x+y+6)+21=\frac{3}{2}\times20+21=51\,(\text{cm}^2)$

62) 7

⇨ $\overline{BQ}=\overline{BP}=x$라 하면 $\overline{AP}=\overline{AR}=6-x$

직각삼각형 ABC에서 $\overline{BC}=x+1$, $\overline{CA}=7-x$이므로

$6^2=(7-x)^2+(1+x)^2$, $2x^2-12x+14=0$

$x^2-6x+7=0$ $\therefore\ x=3\pm\sqrt{2}$

따라서 직각삼각형 ABC의 직각을 끼고 있는 두 변의 길이는 각각 $4+\sqrt{2}$, $4-\sqrt{2}$이므로

$\triangle ABC=\frac{1}{2}\times(4+\sqrt{2})\times(4-\sqrt{2})=7$

63) 28cm^2

64) $4\pi\text{cm}^2$

⇨ □OECF는 정사각형이고, 원 밖의 한 점에서 그 원에 그은 두 접선의 길이는 서로 같으므로

$\overline{AC}=(3+r)\text{cm}$, $\overline{BC}=(10+r)\text{cm}$

족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

피타고라스의 정리에 의하여
$(3+r)^2+(10+r)^2=13^2$
$r^2+13r-30=0$ $\therefore r=2(r>0)$
$\therefore$ (원 O의 넓이)$=\pi\times2^2=4\pi(\mathrm{cm}^2)$

65) $9\pi\,\mathrm{cm}^2$
⇨ 원 O의 반지름의 길이를 $r\,\mathrm{cm}$라 하면
원의 접선의 성질에 의해 $\overline{AB}=(6+r)\,\mathrm{cm}$, $\overline{BC}=(r+9)\,\mathrm{cm}$
$\triangle ABC$에서 $15^2=(6+r)^2+(r+9)^2$
$r^2+15r-54=0$, $(r+18)(r-3)=0$ $\therefore r=3$
따라서 원 O의 넓이는 $9\pi\,\mathrm{cm}^2$이다.

66) $\pi\,\mathrm{cm}^2$
⇨ $\overline{AB}=(3+r)\,\mathrm{cm}$, $\overline{AC}=(2+r)\,\mathrm{cm}$
$(3+r)^2+(2+r)^2=5^2$
$r^2+5r-6=0$ $\therefore r=1\ (r>0)$
$\therefore$ (원 O의 넓이)$=\pi\times1^2=\pi(\mathrm{cm}^2)$

67) ×

68) ○
⇨ 원의 외부에 있는 한 점에서 그 원에 그은 두 접선의 길이는 서로 같다.

69) ×

70) ×

71) ×

72) ○
⇨ 원에 외접하는 사각형의 두 쌍의 대변의 길이의 합은 서로 같다.

73) 3
⇨ $8+(2+x)=6+7$ $\therefore x=3$

74) 9
⇨ $13+x=10+12$ $\therefore x=9$

75) 6
⇨ $\overline{AB}+\overline{CD}=\overline{AD}+\overline{BC}$이므로
$x+4=3+7$ $\therefore x=6$

76) 5
⇨ $\triangle BCD$에서 $\overline{CD}=\sqrt{(\sqrt{61})^2-6^2}=5$
이때 $x+5=4+6$이므로 $x=5$

77) 5
⇨ $\overline{CD}=2\times3=6$이므로
$9+6=x+10$ $\therefore x=5$

78) 10
⇨ $x+7=6+11$ $\therefore x=10$

79) 7
⇨ $5+8=x+6$ $\therefore x=7$

80) 6
⇨ $x+18=11+13$ $\therefore x=6$

81) 6
⇨ $10+8=x+12$ $\therefore x=6$

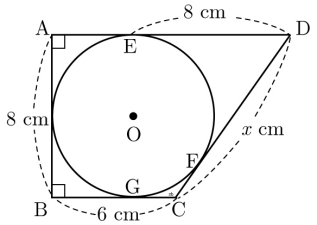
82) 3
⇨ $12+18=(x+7)+20$ $\therefore x=3$

83) 12
⇨ $9+x=6+15$ $\therefore x=12$

84) 8
⇨ $12+14=18+x$ $\therefore x=8$

85) 19
⇨ $x+16=15+20$ $\therefore x=19$

86) 8
⇨ $\overline{AD}+\overline{BC}=\overline{AB}+\overline{CD}$에서
$6+9=7+x$ $\therefore x=8$

87) 10
⇨ 

$\overline{BG}$는 원의 반지름과 같아서 $\frac{1}{2}\times8=4(\mathrm{cm})$이므로
원에 외접하는 사각형 ABCD에서
$\therefore x=\overline{DF}+\overline{CF}=8+(6-4)=10(\mathrm{cm})$

88) 4

89) 3

90) $9\pi\,\mathrm{cm}^2$
⇨ $\angle C=90^\circ$이고, 원 O에 외접하는 사각형ABCD에서 네 접점을 E, F, G, H라 할 때, □OFCG는 정사각형이다.
$\overline{CF}=\overline{CG}=\overline{OF}=r\,\mathrm{cm}$, $\overline{AB}+\overline{DC}=\overline{AD}+\overline{BC}$이므로
$7+5.5=5+(4.5+r)$ $\therefore r=3$
$\therefore$ (원 O의 넓이)$=\pi\times3^2=9\pi(\mathrm{cm}^2)$

91) $36\pi\,\mathrm{cm}^2$
⇨ $12+15=9+(x+12)$ $\therefore x=6$
따라서 원 O의 넓이는 $6^2\pi=36\pi(\mathrm{cm}^2)$이다.

족보닷컴 zocbo.com
Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331

92) 9π

93) $81\pi\,\mathrm{cm}^2$

⇨ $30+18=12+(27+r)$ $\therefore\ r=9$

$\therefore$ (원 O의 넓이) $=\pi\times9^2=81\pi(\mathrm{cm}^2)$

Copyright (c) since 2000 EDUZONE Co,.Ltd all rights reserved
교육지대(주) 서울특별시 강남구 논현동 학동로 130 한주빌딩 7층 대표전화 : 1544-5633 FAX : 02-521-0331