◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시
1) 제작연월일 : 2016-08-25
2) 제작자 : 교육지대㈜
3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초 제작일부터 5년간 보호됩니다.

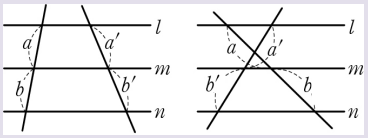
◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법 외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

계산시 참고사항

1. 평행선 사이의 선분의 길이의 비

세 개 이상의 평행선이 다른 두 직선과 만나서 생긴 선분의 길이의 비는 같다.

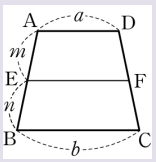
⇨ $l//m//n$이면 $a:b=a':b'$



2. 사다리꼴에서 평행선 사이의 선분의 길이의 비

$\overline{AD}//\overline{BC}$인 사다리꼴 ABCD에서 $\overline{AD}//\overline{EF}//\overline{BC}$일 때,

⇨ $\overline{EF}=\dfrac{mb+na}{m+n}$

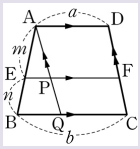


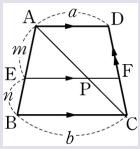
2) 구하는 방법

(1) 평행선을 이용하는 방법

: $\overline{DC}$와 평행한 선분 AQ를 그으면 $\overline{PF}=\overline{AD}=\overline{QC}=a$이므로

$\overline{EP}:\overline{BQ}=\overline{EP}:(b-a)=m:(m+n)$, $\overline{EF}=\overline{EP}+\overline{PF}$





(2) 대각선을 이용하는 방법

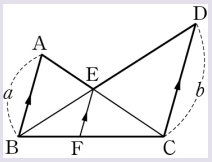
: $\overline{AC}$를 그으면 $\triangle ABC$에서 $\overline{EP}:\overline{BC}=m:(m+n)$

$\triangle ACD$에서 $\overline{PF}:\overline{AD}=n:(m+n)$

3. 평행선 사이의 선분의 길이의 비의 활용

$\overline{AC}$와 $\overline{B}$의 교점을 E라 할 때, $\overline{AB}//\overline{EF}//\overline{DC}$이고 $\overline{AB}=a$, $\overline{CD}=b$이면

1) $\overline{EF}=\dfrac{ab}{a+b}$ 2) $\overline{BF}:\overline{FC}=a:b$



참고

◉ $\triangle AEB\backsim\triangle CED$이므로

$\overline{AE}:\overline{CE}=\overline{AB}:\overline{CD}=a:b$

$\triangle CAB\backsim\triangle CEF$이므로

$\overline{CA}:\overline{CE}=\overline{AB}:\overline{EF}$

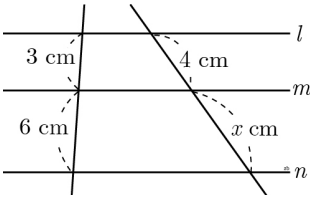
$(a+b):b=a:\overline{EF}$

$\therefore\ \overline{EF}=\dfrac{ab}{a+b}$

평행선 사이의 선분의 길이의 비

◪ 다음 그림에서 $l//m//n$일 때, x의 값을 구하여라.

1.



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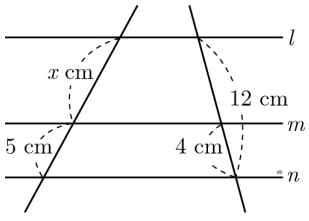

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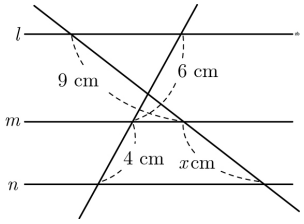

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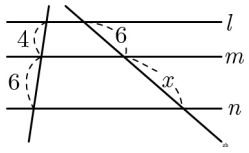

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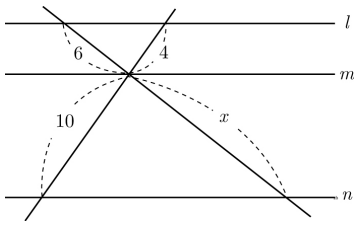

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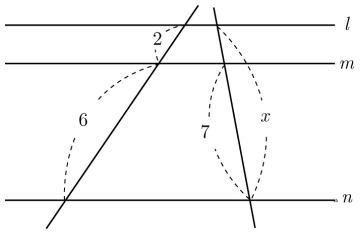

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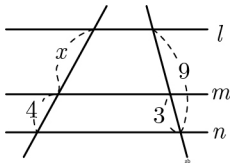

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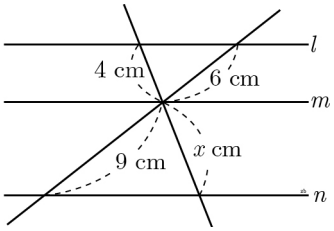

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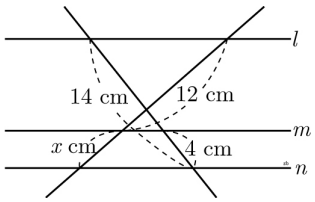

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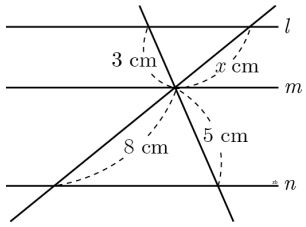

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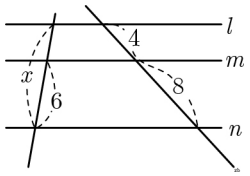

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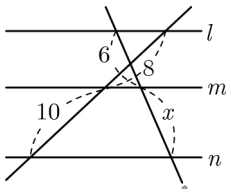

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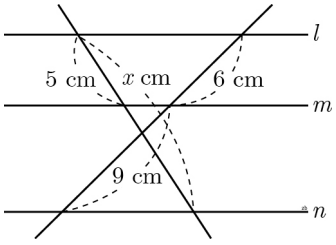

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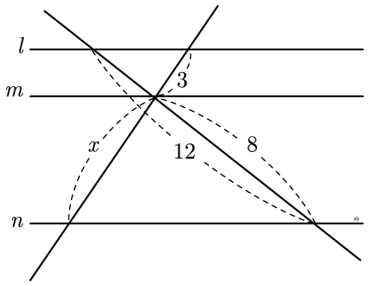

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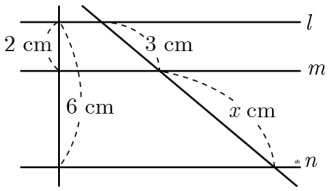

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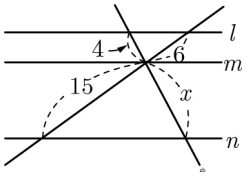

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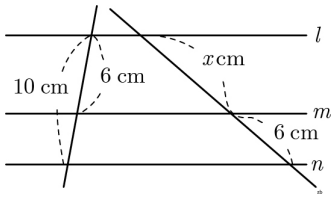

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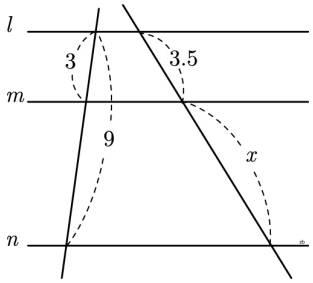

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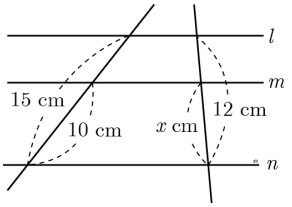

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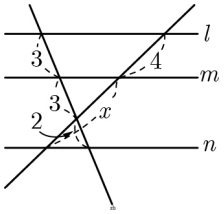

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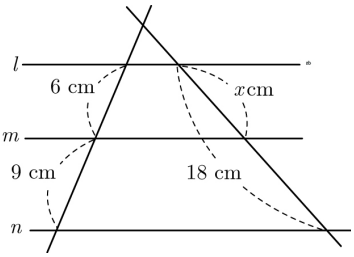

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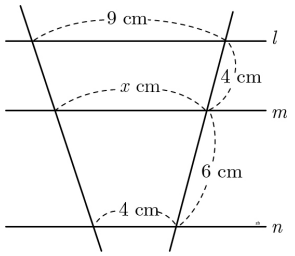

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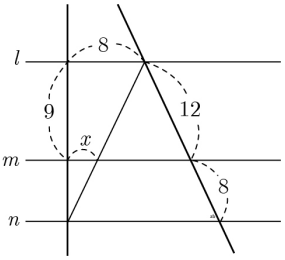

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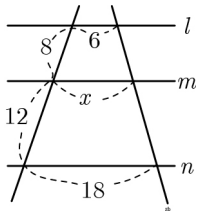

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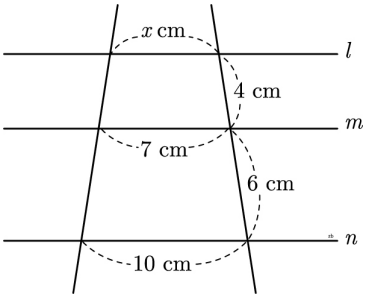

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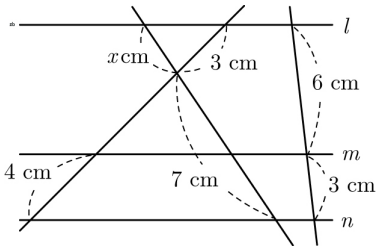

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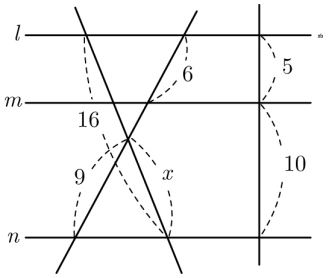

◪ 다음 그림에서 $l//m//n$일 때, $x+y$의 값을 구하여라.

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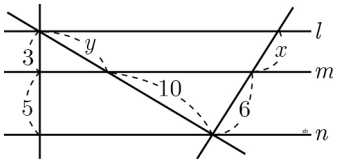

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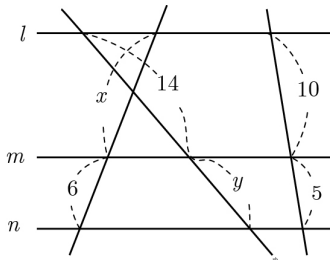

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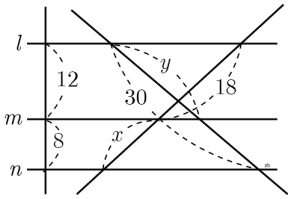

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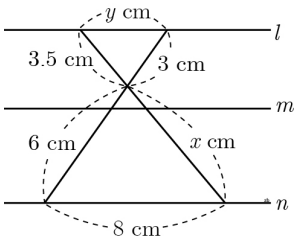

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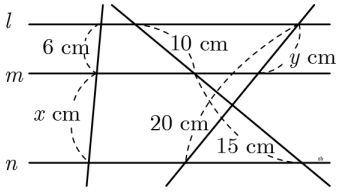

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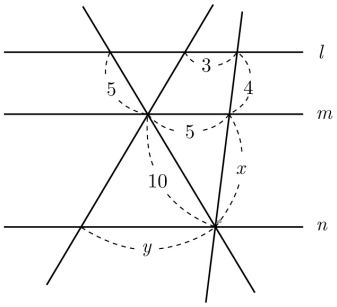

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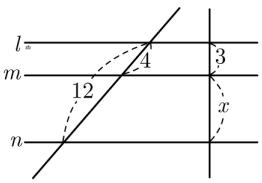

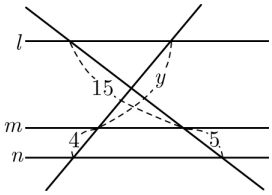

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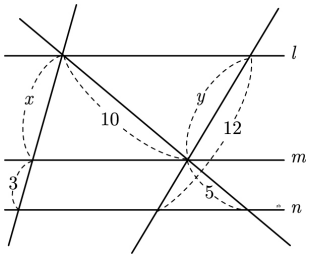

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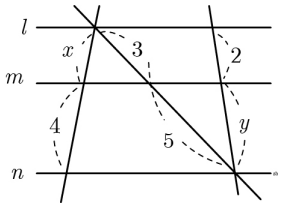

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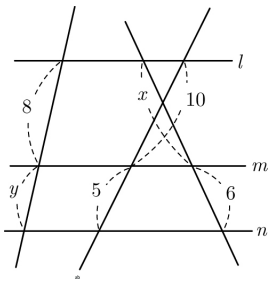
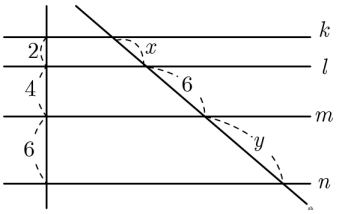


◪ **다음 그림에서 $l//m//n$ 또는 $k//l//m//n$일 때, x, y의 값을 각각 구하여라.**

38.



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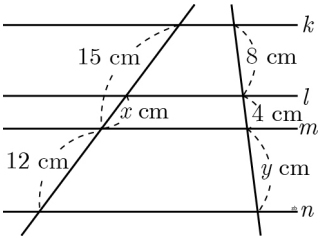

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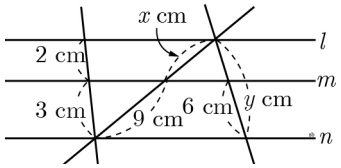
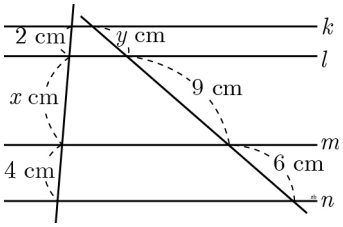
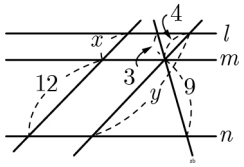


41.



42.



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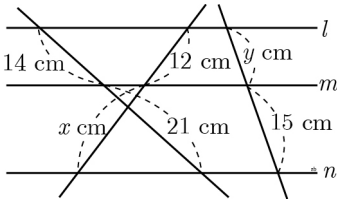
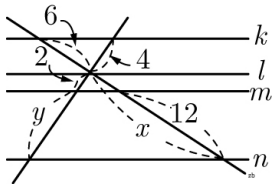
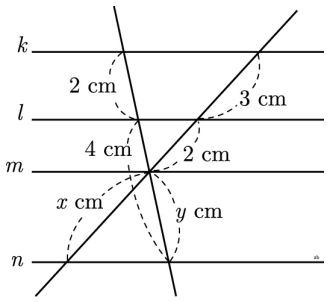
43.



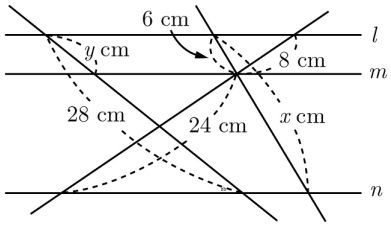
44.



45.

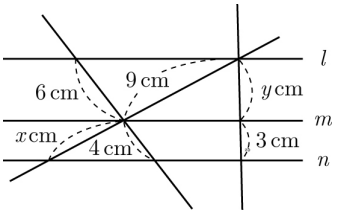


46.

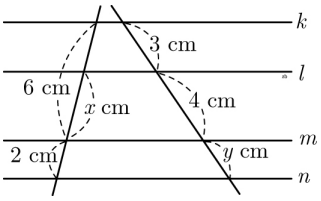


◪ **다음 그림에서 $l//m//n$ 또는 $k//l//m//n$일 때, x, y의 곱 xy의 값을 구하여라.**

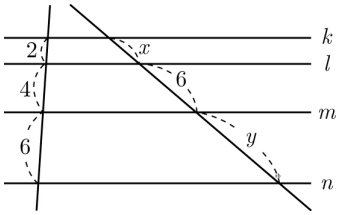
47.



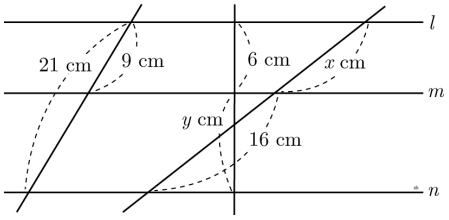
48.



49.



50.



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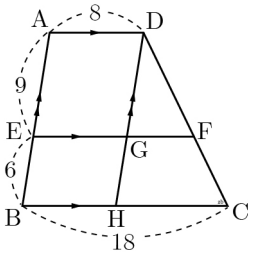
사다리꼴에서 평행선 사이의 선분의 길이의 비

◪ 그림과 같이 $\overline{AD}//\overline{BC}$인 사다리꼴 ABCD에서 $\overline{EF}//\overline{BC}$일 때, 다음을 구하여라.



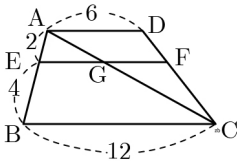
51. $\overline{EG}$의 길이

52. $\overline{HC}$의 길이

53. $\overline{GF}$의 길이

54. $\overline{EF}$의 길이

◪ 다음 그림의 사다리꼴 ABCD에서 $\overline{AD}//\overline{EF}//\overline{BC}$일 때, 다음을 구하여라.



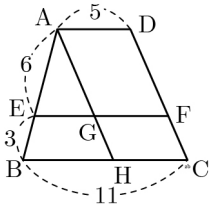
55. $\overline{EG}$의 길이

56. $\overline{GF}$의 길이

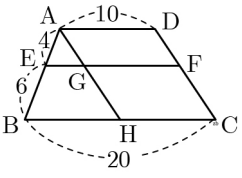
57. $\overline{EF}$의 길이

◪ 다음 그림의 사다리꼴 ABCD에서 $\overline{AD}//\overline{EF}//\overline{BC}$, $\overline{AH}//\overline{DC}$일 때, $\overline{EG}$의 길이와 $\overline{EF}$의 길이를 각각 구하여라.

58.

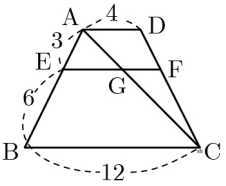


59.

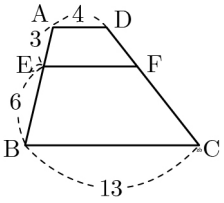


◪ 다음 그림의 사다리꼴 ABCD에서 $\overline{AD}//\overline{EF}//\overline{BC}$일 때, $\overline{EF}$의 길이를 구하여라.

60.



61.



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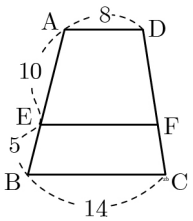
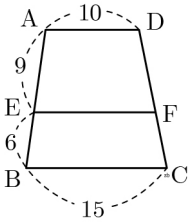
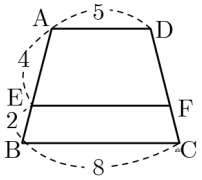
62.



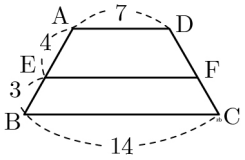
63.



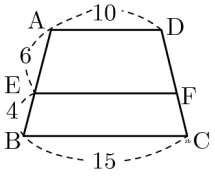
64.



65.

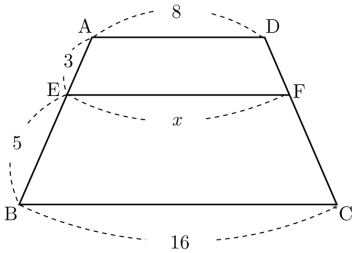


66.

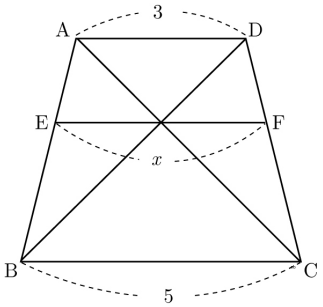


◪ 다음 그림에서 $\overline{AD}//\overline{BC}//\overline{EF}$일 때, x의 값을 구하여라.

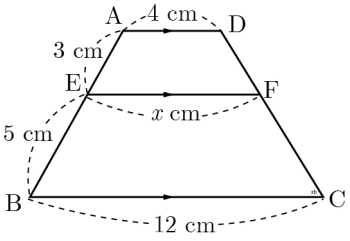
67.



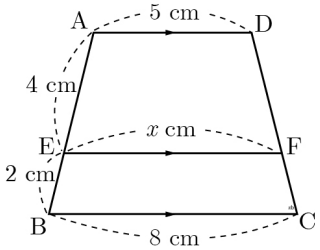
68.



69.



70.



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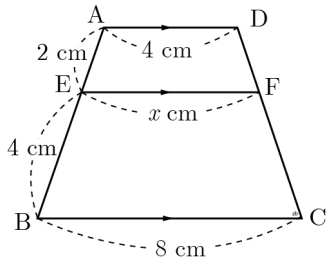
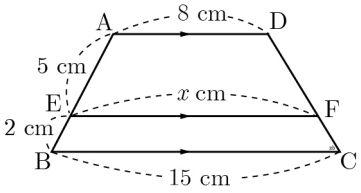
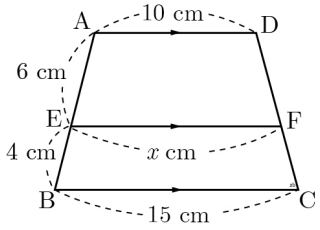
71.



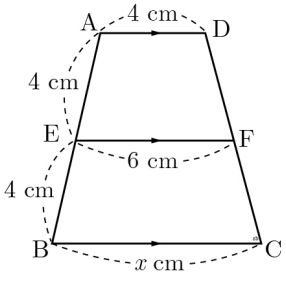
72.



73.

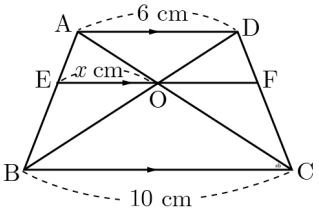


74.

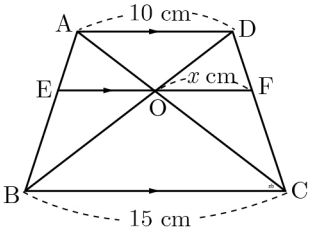


◪ 다음 그림과 같은 사다리꼴 ABCD에서 $\overline{AD}//\overline{EF}//\overline{BC}$ 일 때, x의 값을 구하여라.(단, 점 O는 두 대각선의 교점이다.)

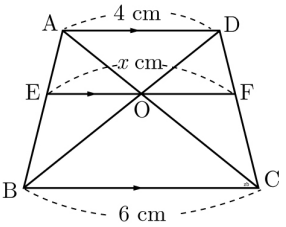
75.



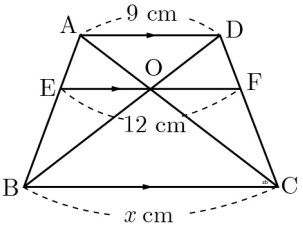
76.



77.



78.



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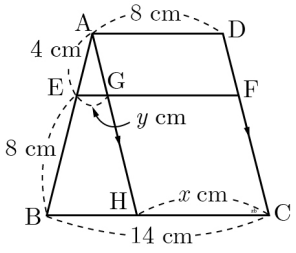
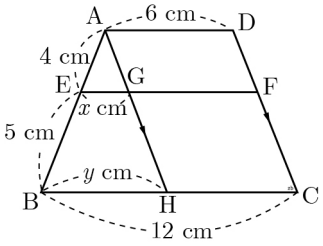
◪ 다음 그림과 같이 $\overline{AD}//\overline{BC}$인 사다리꼴 ABCD에서 $\overline{EF}//\overline{BC}$일 때, x, y의 값을 각각 구하여라.

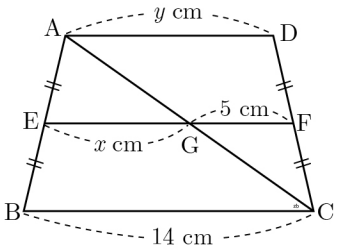
79.



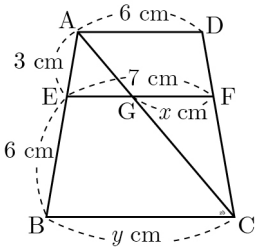
80.



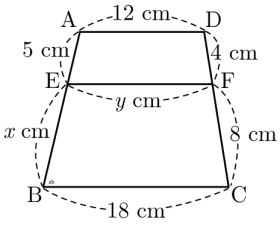
81.



82.



83.



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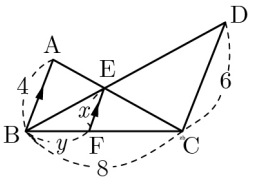
평행선 사이의 선분의 길이의 비의 활용

◪ 다음 그림에서 $\overline{AB}//\overline{EF}//\overline{DC}$일 때, 다음을 구하여라.



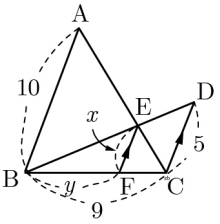
84. $\overline{BE}:\overline{ED}$

85. $\overline{BE}:\overline{BD}$

86. x의 값

87. y의 값

◪ 다음 그림에서 $\overline{AB}//\overline{EF}//\overline{DC}$일 때, 다음을 구하여라.



88. $\overline{BE}:\overline{ED}$

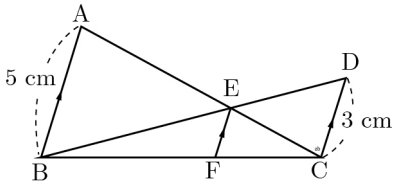
89. $\overline{BE}:\overline{BD}$

90. x의 값

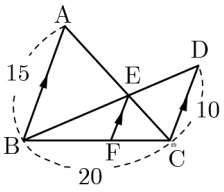
91. y의 값

◪ 다음 그림에서 $\overline{AB}//\overline{EF}//\overline{DC}$일 때, $\overline{EF}$의 길이를 구하여라.

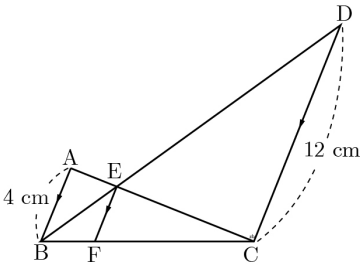
92.



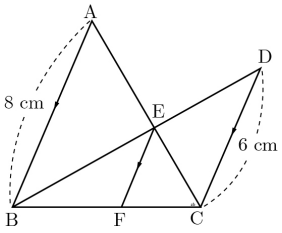
93.



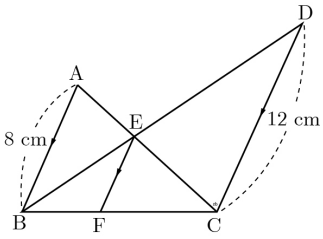
94.



95.



96.



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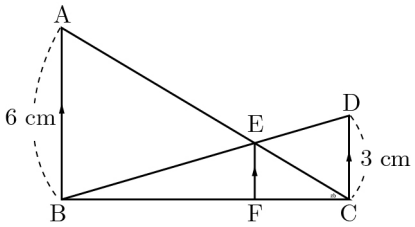
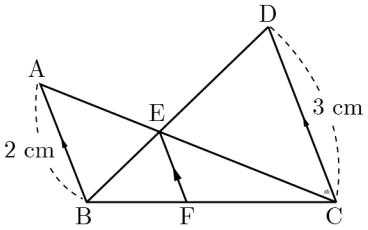
97.

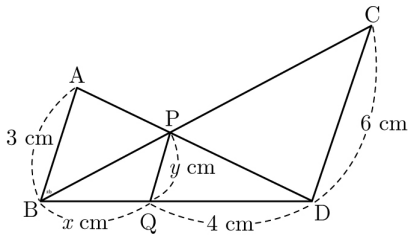


98.

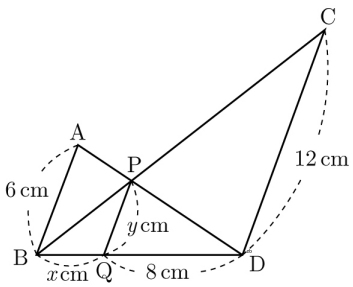


◪ 다음 그림에서 $\overline{AB}//\overline{PQ}//\overline{CD}$일 때, $x+y$의 값을 구하여라.

99.

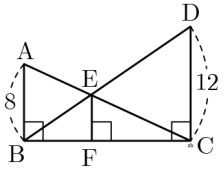


100.

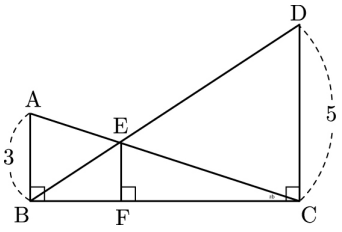


◪ 다음 그림에서 $\overline{AB}$, $\overline{EF}$, $\overline{DC}$가 모두 $\overline{BC}$에 수직일 때, $\overline{EF}$의 길이를 구하여라.

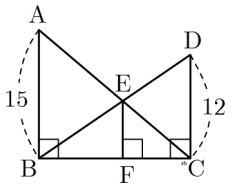
101.



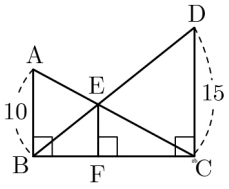
102.



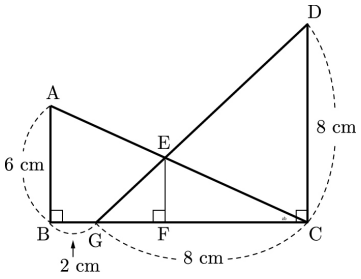
103.



104.



105.



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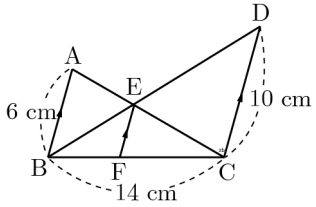
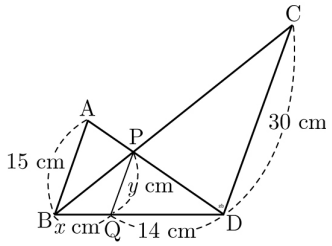
◪ 다음 물음에 답하여라.

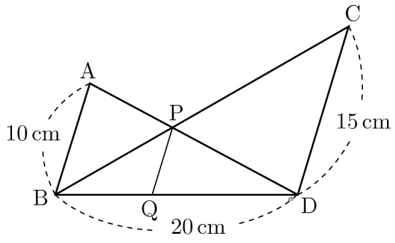
106 다음 그림에서 $\overline{AB}//\overline{EF}//\overline{DC}$일 때, $\overline{BF}+\overline{EF}$의 길이를 구하여라.



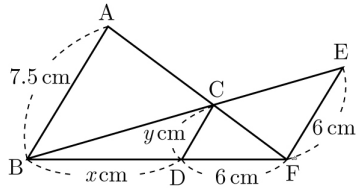
107 다음 그림에서 $\overline{AB}//\overline{PQ}//\overline{CD}$이고 $\overline{AB}=15\text{cm}$, $\overline{CD}=30\text{cm}$, $\overline{QD}=14\text{cm}$일 때, $3y-2x$의 값을 구하여라.



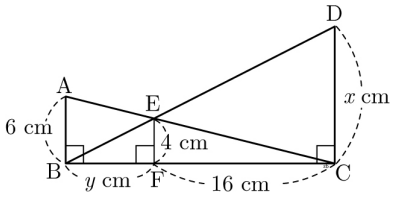
108 $\overline{AB}//\overline{PQ}//\overline{CD}$이고, $\overline{AB}=10\text{cm}$, $\overline{BD}=20\text{cm}$, $\overline{CD}=15\text{cm}$일 때, $\overline{PQ}$의 길이를 구하여라.



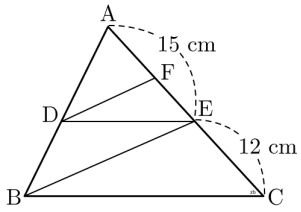
109 다음 그림에서 $\overline{AB}//\overline{CD}//\overline{EF}$이고 $\overline{AB}=7.5\text{cm}$, $\overline{DF}=6\text{cm}$, $\overline{EF}=6\text{cm}$일 때, $x+y$의 값을 구하여라.



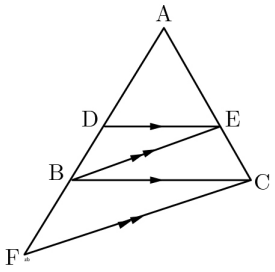
110 다음 그림에서 $\overline{AB}$, $\overline{EF}$, $\overline{CD}$는 각각 $\overline{BC}$와 수직이고, $\overline{AC}$와 $\overline{BD}$가 만나는 점이 E일 때, $x-y$의 값을 구하여라.



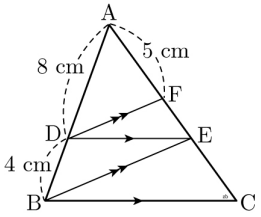
111 다음 그림의 $\triangle ABC$에서 $\overline{BC}//\overline{DE}$, $\overline{BE}//\overline{DF}$이다. $\overline{AE}=15\text{cm}$, $\overline{EC}=12\text{cm}$일 때, $\overline{AF}:\overline{FE}$를 구하여라.



112 $\overline{DE}//\overline{BC}$, $\overline{BE}//\overline{FC}$, $\overline{AD}:\overline{DB}=2:1$일 때, $\overline{AB}:\overline{BF}$의 값을 구하여라.



113 $\triangle ABC$에서 $\overline{BC}//\overline{DE}$, $\overline{BE}//\overline{DF}$이고, $\overline{AD}=8\text{cm}$, $\overline{DB}=4\text{cm}$, $\overline{AF}=5\text{cm}$이다. $\overline{FE}$의 길이는 $a\text{cm}$, $\overline{EC}$의 길이는 $b\text{cm}$일 때, $2a+4b$의 값을 구하여라.



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정답 및 해설

1) 8
⇨ $3:6=4:x$이므로 $3x=24$ $\therefore x=8$

2) 10
⇨ $x:5=(12-4):4$이므로 $4x=40$ $\therefore x=10$

3) 6
⇨ $9:x=6:4$ $\therefore x=6$

4) 9
⇨ $4:6=6:x$ $\therefore\ x=9$

5) 15
⇨ $6:x=4:10$ $\therefore\ x=15$

6) $\frac{28}{3}$
⇨ $2:6=(x-7):7$ $\therefore\ x=\frac{28}{3}$

7) 8
⇨ $x:4=(9-3):3$ $\therefore\ x=8$

8) 6
⇨ $4:x=6:9$이므로 $6x=36$ $\therefore x=6$

9) $\frac{24}{5}$
⇨ $(14-4):4=12:x$이므로 $10x=48$ $\therefore x=\frac{24}{5}$

10) $\frac{24}{5}$
⇨ $3:5=x:8$이므로 $5x=24$ $\therefore x=\frac{24}{5}$

11) 9
⇨ $(x-6):6=4:8$ $\therefore\ x=9$

12) $\frac{15}{2}$
⇨ $6:x=8:10$ $\therefore\ x=\frac{15}{2}$

13) $\frac{25}{2}$
⇨ $5:(x-5)=6:9$이므로
$6(x-5)=45,\ 6x=75$ $\therefore x=\frac{25}{2}$

14) 6
⇨ $3:x=4:8$ $\therefore x=6$

15) 6
⇨ $2:(6-2)=3:x$이므로 $2x=12$ $\therefore x=6$

16) 10
⇨ $4:x=6:15$ $\therefore\ x=10$

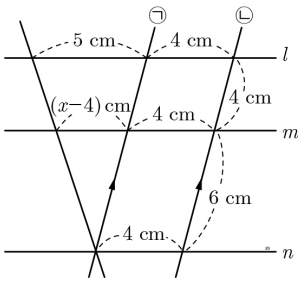
17) 9
⇨ $6:4=x:6 \Rightarrow 4x=36 \Rightarrow x=9$

18) 7
⇨ $3:6=3.5:x$ $\therefore x=7$

19) 8
⇨ $(15-10):10=(12-x):x$이므로
$5x=10(12-x),\ 15x=120$ $\therefore x=8$

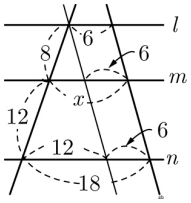
20) $\frac{20}{3}$
⇨ $3:(3+2)=4:x$ $\therefore\ x=\frac{20}{3}$

21) $\frac{36}{5}$
⇨ $6:15=x:18,\quad x=\frac{36}{5}$

22) 7
⇨ 

위 그림에서 ㉡에 평행하도록 ㉠을 긋고 풀면
$6:10=(x-4):5,\ 10(x-4)=30$ $\therefore\ x=7$

23) $\frac{16}{5}$
⇨ $8:20=x:8$ $\therefore x=\frac{16}{5}(=3.2)$

24) $\frac{54}{5}$
⇨ 

$8:(8+12)=(x-6):12$
$x-6=\frac{24}{5}$ $\therefore\ x=\frac{24}{5}+6=\frac{54}{5}$

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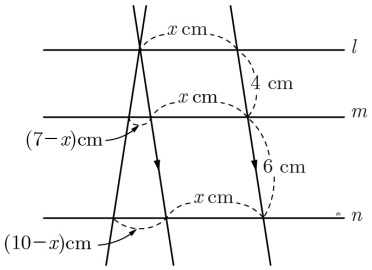
25) 5

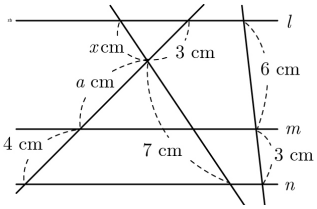


⇨ $4:10=(7-x):(10-x)$

$40-4x=70-10x$

$x=5$

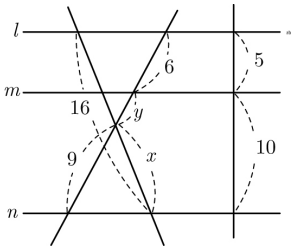
26) $\frac{7}{3}$



⇨ 위 그림에서 $6:3=(3+a):4$ $\therefore a=5$

$x:7=3:(5+4)$, $x=\frac{7}{3}$ 이다.

27) 8



⇨ 위 그림에서 $6:(y+9)=5:10 \Rightarrow y+9=12 \Rightarrow \therefore y=3$ 이다.

이 때, $(16-x):x=1:1 \Rightarrow x=16-x \Rightarrow \therefore x=8$ 이다.

28) $\frac{48}{5}$

⇨ $3:5=y:10$ 이므로 $5y=30$ $\therefore y=6$

$3:5=x:6$ 이므로 $5x=18$ $\therefore x=\frac{18}{5}$

$\therefore x+y=\frac{18}{5}+6=\frac{48}{5}$

29) 19

⇨ $x:6=10:5$, $x=12$ 이고, $14:y=10:5$, $y=7$ 이다.

따라서 $x+y=12+7=19$ 이다.

30) 30

⇨ $12:8=18:x$, $12x=144$, $x=12$ 이다.

또, $12:8=y:(30-y)$, $8y=360-12y$, $y=18$ 이다.

따라서 $x+y=30$ 이다.

31) 11

⇨ $3:6=3.5:x$, $x=7$ 이고, $y:8=3:6$, $y=4$ 이다.

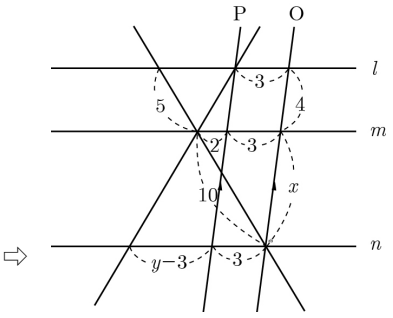
따라서 $x+y=7+4=11$ 이다.

32) 17

⇨ $6:x=10:15$, $x=9$ 이고, $y:20=10:25$, $y=8$ 이다.

따라서 $x+y=17$ 이다.

33) 17cm



⇨ ㉠ $4:x=5:10$, $x=8$

㉡ 직선 O와 평행한 직선 P를 그으면 위의 그림과 같이 나타낼 수 있다. 이 때, $2:(y-3)=1:3$, $y=9$ 이다.

따라서 $x+y=17$ 이다.

34) 18

⇨ $4:8=3:x$ $\therefore x=6$

$y:4=15:5$ $\therefore y=12$

$\therefore$ $x+y=18$

35) 14

⇨ $x:3=10:5$ $\therefore x=6$

$10:5=y:(12-y) \Rightarrow y=24-2y \Rightarrow \therefore y=8$

따라서 $x+y=14$ 이다.

36) $\frac{86}{15}$

⇨ $x:4=3:5$, $x=\frac{12}{5}$ 이고, $3:5=2:y$, $y=\frac{10}{3}$ 이다.

따라서 $x+y=\frac{12}{5}+\frac{10}{3}=\frac{86}{15}$ 이다.

37) 16

⇨ $x:6=10:5$ $\therefore x=12$

$8:y=10:5$ $\therefore y=4$

따라서 $x+y=16$ 이다.

38) $x=3$, $y=9$

⇨ $2:4=x:6$ $\therefore x=3$

$4:6=6:y$ $\therefore y=9$

39) $x=5$, $y=\frac{48}{5}$

⇨ $(15-x):x=8:4$ 이므로 $8x=4(15-x)$

$12x=60$ $\therefore x=5$

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$5:12=4:y$이므로 $5y=48$ $\therefore y=\frac{48}{5}$

40) $x=6,\ y=10$

⇨ $2:3=x:9$이므로 $3x=18$ $\therefore x=6$

$2:3=(y-6):6$이므로 $3(y-6)=12$

$3y=30$ $\therefore y=10$

41) $x=6,\ y=3$

⇨ $x:4=9:6$이므로 $6x=36$ $\therefore x=6$

$2:6=y:9$이므로 $6y=18$ $\therefore y=3$

42) $x=4,\ y=16$

⇨ $x:12=3:9$ $\therefore\ x=4$

$4:y=3:(3+9)$ $\therefore\ y=16$

43) $x=18,\ y=10$

⇨ $14:21=12:x$이므로 $14x=252$ $\therefore x=18$

$14:21=y:15$이므로 $21y=210$ $\therefore y=10$

44) $x=15,\ y=8$

⇨ $6:(x-12)=4:2$ $\therefore\ x=15$

$2:y=(x-12):12$에서

$2:y=3:12$ $\therefore\ y=8$

45) $x=4,\ y=\frac{8}{3}$

⇨ $(4-y):2=2:3$

$4=12-3y$

$3y=8$ $\therefore y=\frac{8}{3}$

$x:2=\frac{8}{3}:\left(4-\frac{8}{3}\right)$

$x:2=\frac{8}{3}:\frac{4}{3}$ $\therefore x=4$

46) $x=24,\ y=7$

⇨ $8:24=6:(x-6)$

$1:3=6:(x-6)$

$x-6=18$

$\therefore x=24$

$24:8=(28-y):y$

$28-y=3y$

$4y=28$

$\therefore y=7$

47) 27

⇨ $9:x=6:4,\ x=6$

$6:4=y:3,\ y=\frac{9}{2}$ $\therefore\ xy=27$

48) 8

⇨ $(6-x):x=3:4,\ 3x=4(6-x),\ 7x=24$ $\therefore\ x=\frac{24}{7}$

$6:2=7:y$ $\therefore\ y=\frac{7}{3}$

$\therefore\ xy=\frac{24}{7}\times\frac{7}{3}=8$

49) 27

⇨ $2:4=x:6,\ x=3$이고, $4:6=6:y,\ y=9$이다.

$\therefore\ xy=27$

50) 96

⇨ $x:16=9:12$ $\therefore x=12$

$6:y=9:12$ $\therefore y=8$

그러므로 $xy=96$이다.

51) 8

⇨ □ABHD는 평행사변형이므로

$\overline{EG}=\overline{BH}=\overline{AD}=8$

52) 10

⇨ $\overline{HC}=\overline{BC}-\overline{BH}=18-8=10$

53) 6

⇨ △DHC에서

$9:(9+6)=\overline{GF}:10$ $\therefore \overline{GF}=6$

54) 14

⇨ $\overline{EF}=\overline{EG}+\overline{GF}=8+6=14$

55) 4

⇨ △ABC에서 $2:(2+4)=\overline{EG}:12$ $\therefore\ \overline{EG}=4$

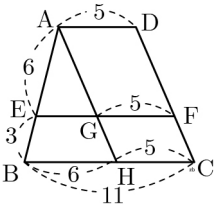
56) 4

⇨ △ACD에서 $4:(4+2)=\overline{GF}:6$ $\therefore\ \overline{GF}=4$

57) 8

⇨ $\overline{EF}=\overline{EG}+\overline{GF}=4+4=8$

58) $\overline{EG}=4,\ \overline{EF}=9$



⇨

△ABH에서 $6:(6+3)=\overline{EG}:6$ $\therefore\ \overline{EG}=4$

$\therefore\ \overline{EF}=\overline{EG}+\overline{GF}=4+5=9$

59) $\overline{EG}=4,\ \overline{EF}=14$

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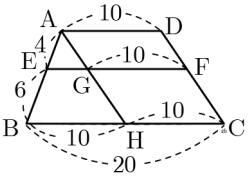


△ABH에서 $4:(4+6)=\overline{EG}:10$ ∴ $\overline{EG}=4$

∴ $\overline{EF}=\overline{EG}+\overline{GF}=4+10=14$

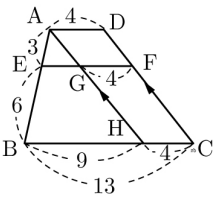
60) $\frac{20}{3}$

⇨ △ABC에서 $3:(3+6)=\overline{EG}:12$ ∴ $\overline{EG}=4$

△ACD에서 $6:(6+3)=\overline{GF}:4$ ∴ $\overline{GF}=\frac{8}{3}$

∴ $\overline{EF}=\overline{EG}+\overline{GF}=4+\frac{8}{3}=\frac{20}{3}$

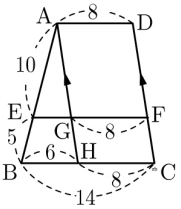
61) 7



(1) △ABH에서 $3:(3+6)=\overline{EG}:9$ ∴ $\overline{EG}=3$

(2) $\overline{EF}=\overline{EG}+\overline{GF}=3+4=7$

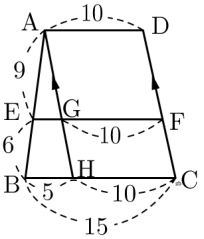
62) 12



(1) △ABH에서 $10:(10+5)=\overline{EG}:6$ ∴ $\overline{EG}=4$

(2) $\overline{EF}=\overline{EG}+\overline{GF}=4+8=12$

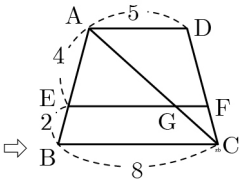
63) 13



(1) △ABH에서 $9:(9+6)=\overline{EG}:5$ ∴ $\overline{EG}=3$

(2) $\overline{EF}=\overline{EG}+\overline{GF}=3+10=13$

64) 7

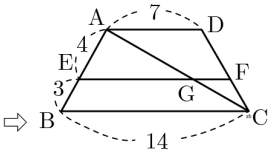


△ABC에서 $4:(4+2)=\overline{EG}:8$ ∴ $\overline{EG}=\frac{16}{3}$

△ACD에서 $2:(2+4)=\overline{GF}:5$ ∴ $\overline{GF}=\frac{5}{3}$

$\overline{EF}=\overline{EG}+\overline{GF}=\frac{16}{3}+\frac{5}{3}=7$

65) 11

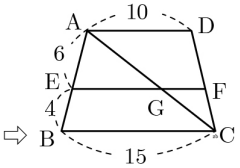


△ABC에서 $4:(4+3)=\overline{EG}:14$ ∴ $\overline{EG}=8$

△ACD에서 $3:(3+4)=\overline{GF}:7$ ∴ $\overline{GF}=3$

$\overline{EF}=\overline{EG}+\overline{GF}=8+3=11$

66) 13



△ABC에서 $6:(6+4)=\overline{EG}:15$ ∴ $\overline{EG}=9$

△ACD에서 $4:(4+6)=\overline{GF}:10$ ∴ $\overline{GF}=4$

$\overline{EF}=\overline{EG}+\overline{GF}=9+4=13$

67) 11

⇨ $\overline{AC}$와 $\overline{EF}$의 교점을 G라고 하면

$3:8=\overline{EG}:16$ ∴ $\overline{EG}=6$

$5:8=\overline{GF}:8$ ∴ $\overline{GF}=5$

∴ $\overline{EF}=\overline{EG}+\overline{GF}=11$

68) $\frac{15}{4}$

⇨ $\overline{AC}$와 $\overline{EF}$의 교점을 G라고 하면

△AGD∽△CGB이고 $\overline{BG}:\overline{GD}=5:3$이므로

$5:8=\overline{EG}:3$ ∴ $\overline{EG}=\frac{15}{8}$

∴ $\overline{EF}=2\overline{EG}=\frac{15}{4}$

69) 7

⇨ 다음 그림과 같이 $\overline{DC}$에 평행한 $\overline{AH}$를 그으면

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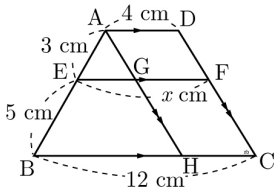


$\overline{GF}=\overline{HC}=\overline{AD}=4(\text{cm})$

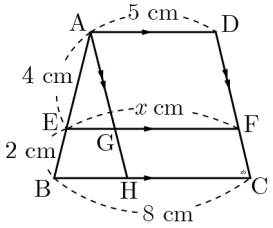
$\overline{BH}=12-4=8(\text{cm})$이므로 $\triangle ABH$에서

$3:(3+5)=\overline{EG}:8 \qquad \therefore \overline{EG}=3(\text{cm})$

$\therefore x=\overline{EG}+\overline{GF}=3+4=7$

70) 7

⇨ 다음 그림과 같이 $\overline{DC}$에 평행한 $\overline{AH}$를 그으면



$\overline{GF}=\overline{HC}=\overline{AD}=5(\text{cm})$

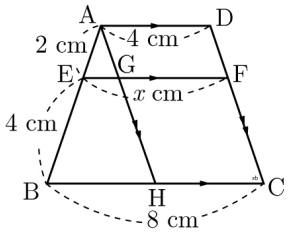
$\overline{BH}=8-5=3(\text{cm})$이므로 $\triangle ABH$에서

$4:(4+2)=\overline{EG}:3 \qquad \therefore \overline{EG}=2(\text{cm})$

$\therefore x=\overline{EG}+\overline{GF}=2+5=7$

71) $\frac{16}{3}$

⇨ 다음 그림과 같이 $\overline{DC}$에 평행한 $\overline{AH}$를 그으면



$\overline{GF}=\overline{HC}=\overline{AD}=4(\text{cm})$

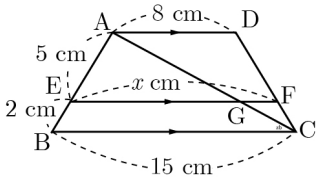
$\overline{BH}=8-4=4(\text{cm})$이므로 $\triangle ABH$에서

$2:(2+4)=\overline{EG}:4 \qquad \therefore \overline{EG}=\frac{4}{3}(\text{cm})$

$\therefore x=\overline{EG}+\overline{GF}=\frac{4}{3}+4=\frac{16}{3}$

72) 13

⇨ 다음 그림과 같이 $\overline{AC}$를 그으면 $\triangle ABC$에서



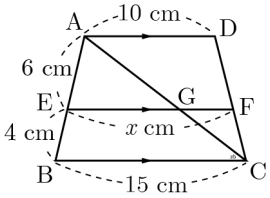
$5:(5+2)=\overline{EG}:15 \qquad \therefore \overline{EG}=\frac{75}{7}(\text{cm})$

$\triangle ACD$에서 $2:(2+5)=\overline{GF}:8 \qquad \therefore \overline{GF}=\frac{16}{7}(\text{cm})$

$\therefore x=\overline{EG}+\overline{GF}=\frac{75}{7}+\frac{16}{7}=13$

73) 13

⇨ 다음 그림과 같이 $\overline{AC}$를 그으면 $\triangle ABC$에서



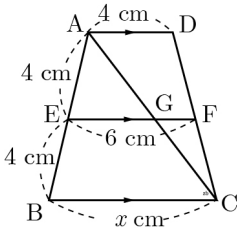
$6:(6+4)=\overline{EG}:15 \qquad \therefore \overline{EG}=9(\text{cm})$

$\triangle ACD$에서 $4:(4+6)=\overline{GF}:10 \qquad \therefore \overline{GF}=4(\text{cm})$

$\therefore x=\overline{EG}+\overline{GF}=9+4=13$

74) 8

⇨ 다음 그림과 같이 $\overline{AC}$를 그으면 $\triangle ACD$에서



$4:(4+4)=\overline{GF}:4 \qquad \therefore \overline{GF}=2(\text{cm})$

따라서 $\overline{EG}=6-2=4(\text{cm})$이므로 $\triangle ABC$에서

$4:(4+4)=4:x \qquad \therefore x=8$

75) $\frac{15}{4}$

⇨ $\triangle AOD \backsim \triangle COB$(AA 닮음)이므로

$\overline{AO}:\overline{CO}=6:10=3:5$

$\triangle ABD$에서 $x:6=5:8 \qquad \therefore x=\frac{15}{4}$

76) 6

⇨ $\triangle AOD \backsim \triangle COB$(AA 닮음)이므로

$\overline{AO}:\overline{CO}=10:15=2:3$

$\triangle ACD$에서 $x:10=3:5 \qquad \therefore x=6$

77) $\frac{24}{5}$

⇨ $\triangle AOD \backsim \triangle COB$(AA 닮음)이므로

$\overline{AO}:\overline{CO}=4:6=2:3$

$\triangle ABC$에서 $\overline{EO}:6=2:5 \qquad \therefore \overline{EO}=\frac{12}{5}(\text{cm})$

$\triangle ACD$에서 $\overline{OF}:4=3:5 \qquad \therefore \overline{OF}=\frac{12}{5}(\text{cm})$

$\therefore x=\overline{EO}+\overline{OF}=\frac{24}{5}$

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78) 18
⇨ $\overline{AE}:\overline{AB}=\overline{EO}:\overline{BC}$, $\overline{DF}:\overline{DC}=\overline{OF}:\overline{BC}$,
$\overline{AE}:\overline{AB}=\overline{DF}:\overline{DC}$이므로 $\overline{EO}=\overline{OF}=6(\text{cm})$
$\overline{BE}:\overline{BA}=\overline{EO}:\overline{AD}=6:9=2:3$이므로 $\overline{AE}:\overline{AB}=1:3$
따라서 △ABC에서 $6:x=1:3$ $\therefore x=18$

79) $x=8$, $y=2$
⇨ □AHCD는 평행사변형이므로 $x=\overline{GF}=\overline{AD}=8$
따라서 $\overline{BH}=\overline{BC}-\overline{HC}=14-8=6(\text{cm})$이므로
△ABH에서 $4:(4+8)=y:6$ $\therefore y=2$

80) $x=\frac{8}{3}$, $y=6$
⇨ □AHCD는 평행사변형이므로 $\overline{HC}=\overline{AD}=6(\text{cm})$
따라서 $y=\overline{BC}-\overline{HC}=12-6=6$이므로 △ABH에서
$4:(4+5)=x:6$ $\therefore x=\frac{8}{3}$

81) $x=7$, $y=10$
⇨ △ABC에서 $1:2=x:14$ $\therefore x=7$
△ACD에서 $1:2=5:y$ $\therefore y=10$

82) $x=4$, $y=9$
⇨ △ACD에서 $6:(6+3)=x:6$ $\therefore x=4$
△ABC에서 $3:(3+6)=(7-4):y$ $\therefore y=9$

83) $x=10$, $y=14$
⇨ $5:x=4:8$ $\therefore x=10$
$1:3=(y-12):(18-12)$
$1:3=(y-12):6$
$y-12=2$
$\therefore y=14$

84) 2 : 3

85) 2 : 5

86) $\frac{12}{5}$

⇨ $x:6=2:5$ $\therefore x=\frac{12}{5}$

87) $\frac{16}{5}$

⇨ $y:8=2:5$ $\therefore y=\frac{16}{5}$

88) 2 : 1

89) 2 : 3

90) $\frac{10}{3}$

⇨ $2:3=x:5$ $\therefore x=\frac{10}{3}$

91) 6
⇨ $2:3=y:9$ $\therefore y=6$

92) $\frac{15}{8}$cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=5:3$
따라서 △BCD에서 $\overline{EF}:3=5:8$ $\therefore \overline{EF}=\frac{15}{8}(\text{cm})$

93) 6
⇨ $\overline{BE}:\overline{ED}=3:2$이므로 $\overline{BE}:\overline{BD}=3:5$
$\overline{EF}:10=3:5$ $\therefore \overline{EF}=6$

94) 3cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=4:12=1:3$
따라서 △BCD에서
$\overline{EF}:12=1:4$ $\therefore \overline{EF}=3(\text{cm})$

95) $\frac{24}{7}$cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=8:6=4:3$
따라서 △BCD에서 $\overline{EF}:6=4:7$ $\therefore \overline{EF}=\frac{24}{7}(\text{cm})$

96) $\frac{24}{5}$cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=8:12=2:3$
따라서 △BCD에서 $\overline{EF}:12=2:5$ $\therefore \overline{EF}=\frac{24}{5}(\text{cm})$

97) 2cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=6:3=2:1$
따라서 △BCD에서 $\overline{EF}:3=2:3$ $\therefore \overline{EF}=2(\text{cm})$

98) $\frac{6}{5}$cm
⇨ △ABE∽△CDE(AA 닮음)이므로
$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=2:3$
따라서 △BCD에서 $\overline{EF}:3=2:5$ $\therefore \overline{EF}=\frac{6}{5}(\text{cm})$

99) 4
⇨ $\overline{AB}:\overline{CD}=\overline{AP}:\overline{PD}=1:2$이다.
$4:x=2:1$ $\therefore x=2$
$y:3=2:3$ $\therefore y=2$

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$\therefore\ x+y=4$

100) 8

⇨ $\overline{AB}:\overline{CD}=\overline{BP}:\overline{PC}=1:2$이다.

이 때, $x:8=1:2,\ x=4$이고, $y:12=1:3,\ y=4$이다.

따라서 $x+y=8$이다.

101) $\frac{24}{5}$

⇨ $\overline{AB}//\overline{EF}//\overline{DC}$이므로 $\overline{BE}:\overline{ED}=8:12=2:3$

$\triangle BCD$에서 $\overline{EF}:12=2:5\quad\therefore\ \overline{EF}=\frac{24}{5}$

102) $\frac{15}{8}$

103) $\frac{20}{3}$

⇨ $\overline{AB}//\overline{EF}//\overline{DC}$이므로 $\overline{BE}:\overline{ED}=5:4$

$\overline{EF}:12=5:9\qquad\therefore\ \overline{EF}=\frac{20}{3}$

104) 6

⇨ $\overline{AB}//\overline{EF}//\overline{DC}$이므로 $\overline{BE}:\overline{ED}=2:3$

$\overline{EF}:15=2:5\qquad\therefore\ \overline{EF}=6$

105) 3cm

⇨ $\triangle EGF\backsim\triangle DGC$(AA 닮음)이고 $\triangle DGC$는 직각이등변삼각형이므로 $\overline{EF}=x$ cm이라 하면 $\overline{GF}=x$cm이고, $\overline{CF}=8-x$(cm)이다.

$\triangle ABC$에서 $\triangle ABC\backsim\triangle EFC$이므로

$\overline{EF}:\overline{AB}=\overline{CF}:\overline{CB}$

$x:6=8-x:10\qquad\therefore x=3$

106) 9cm

⇨ $\triangle ABE\backsim\triangle CDE$(AA 닮음)이므로

$\overline{BE}:\overline{DE}=\overline{AB}:\overline{CD}=6:10=3:5$

$\triangle BCD$에서 $\overline{BE}:\overline{BD}=\overline{BF}:\overline{BC}$이므로

$3:(3+5)=\overline{BF}:14\qquad\therefore\overline{BF}=\frac{21}{4}$(cm)

$\overline{BE}:\overline{BD}=\overline{EF}:\overline{DC}$이므로

$3:(3+5)=\overline{EF}:10\qquad\therefore\overline{EF}=\frac{15}{4}$(cm)

$\therefore\overline{BF}+\overline{EF}=\frac{21}{4}+\frac{15}{4}=9$(cm)

107) 16

⇨ $\overline{AB}:\overline{CD}=\overline{AP}:\overline{PD}=1:2$이다.

이 때, $x:14=1:2,\ x=7$이고, $y:15=2:3,\ y=10$이다.

따라서 $3y-2x=30-14=16$이다.

108) 6cm

⇨ $\triangle ABP\backsim\triangle DCP$(AA닮음)이고, 닮음비는 2:3이다.

이 때, $\overline{BP}:\overline{BC}=\overline{PQ}:\overline{CD}$가 성립하므로

$2:5=\overline{PQ}:15,\ \overline{PQ}=6$cm이다.

109) $\frac{65}{6}$

⇨ $\overline{AB}:\overline{EF}=\overline{BC}:\overline{CE}=5:4$이다.

이 때, $x:6=5:4,\ x=\frac{15}{2}$이고, $y:6=5:9,\ y=\frac{10}{3}$이다.

따라서 $x+y=\frac{15}{2}+\frac{10}{3}=\frac{65}{6}$이다.

110) 4

⇨ $\overline{AB}//\overline{EF}//\overline{DC}$이므로 $\overline{EF}:\overline{AB}=\overline{CE}:\overline{CA}=2:3$이다.

즉, $\overline{CE}:\overline{AE}=2:1$이고, $\overline{CE}:\overline{AE}=\overline{DC}:\overline{AB}$이므로

$2:1=x:6,\ x=12$이다.

또, $\overline{CE}:\overline{AE}=\overline{CF}:\overline{BF}$이므로 $2:1=16:y,\ y=8$이다.

따라서 $x-y=4$이다.

111) 5:4

⇨ $\overline{AE}:\overline{EC}=\overline{AD}:\overline{DB}=\overline{AF}:\overline{FE}$ 이므로

$\overline{AF}:\overline{FE}=15:12=5:4$이다.

112) 2:1

⇨ $\overline{DE}//\overline{BC}$이므로 $\overline{AD}:\overline{DB}=\overline{AE}:\overline{EC}=2:1$이고,

$\overline{BE}//\overline{FC}$이므로 $\overline{AB}:\overline{BF}=\overline{AE}:\overline{EC}=2:1$이다.

이 때, $\overline{AD}=2x,\ \overline{DB}=x$라 하면 $\overline{BF}=\frac{3}{2}x$이다.

따라서 $\overline{AB}:\overline{BF}=3x:\frac{3}{2}x=2:1$이다.

113) 20

⇨ $\overline{AD}:\overline{DB}=\overline{AF}:\overline{FE}=2:1$이므로

$\overline{AF}=5$cm일 때, $\overline{FE}=\frac{5}{2}$cm이다.

또, $\overline{AD}:\overline{DB}=\overline{AE}:\overline{EC}=2:1$이므로

$\overline{AE}=\frac{15}{2}$cm일 때, $\overline{EC}=\frac{15}{4}$cm이다.

따라서 $\overline{FE}=a$cm, $\overline{EC}=b$cm라 하면 $2a+4b=20$이다.

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