



◇ 「콘텐츠산업 진흥법 시행령」 제33조에 의한 표시
1) 제작연월일 : 2016-10-25
2) 제작자 : 교육지대(주)
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

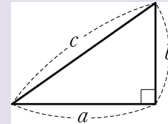
1. 피타고라스의 정리

직각삼각형에서 직각을 끼고 있는 두 변의 길이를 각각 a , b 라 하고,
빗변의 길이를 c 라 하면 $a^2 + b^2 = c^2$

2. 직각삼각형의 변의 길이

직각삼각형에서 직각을 끼고 있는 두 변의 길이를 각각 a , b 라 하고,
빗변의 길이를 c 라 하면

- (1) a , b 의 길이가 주어졌을 때, $c = \sqrt{a^2 + b^2}$
- (2) a , c 의 길이가 주어졌을 때, $b = \sqrt{c^2 - a^2}$
- (3) b , c 의 길이가 주어졌을 때, $a = \sqrt{c^2 - b^2}$



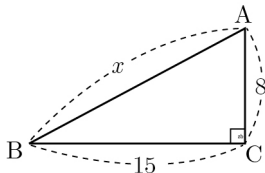
참고

- 직각삼각형에서는 두 변의 길이를
알면 한 변의 길이를 구할 수 있다

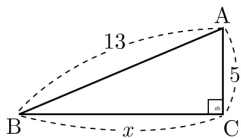
직각삼각형의 변의 길이

■ 다음 그림의 직각삼각형 ABC에서 x 의 값을 구하여라.

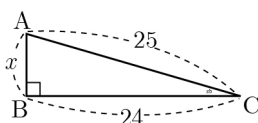
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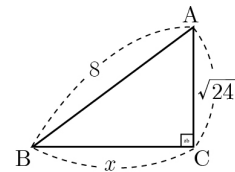
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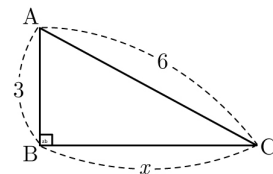
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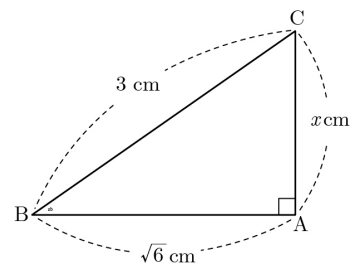
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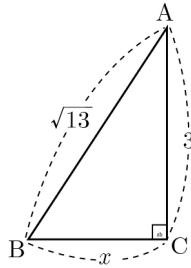
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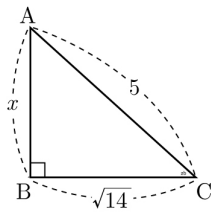
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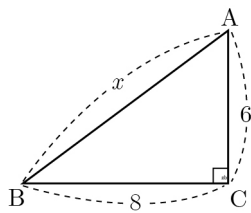
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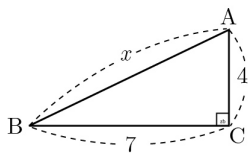
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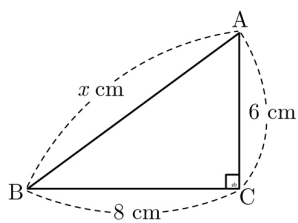
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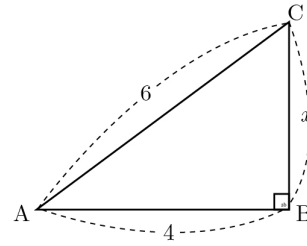
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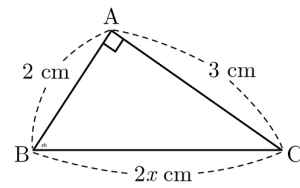
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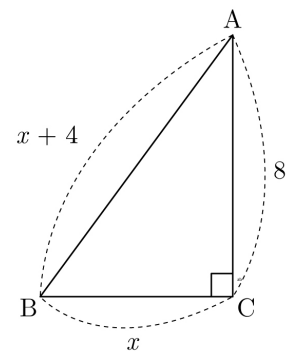
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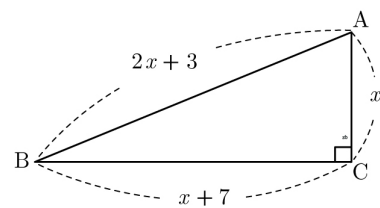
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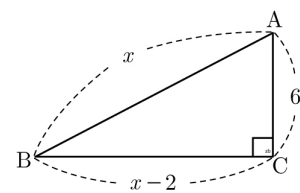
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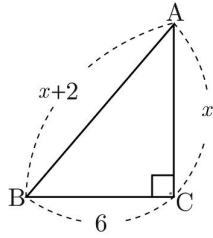
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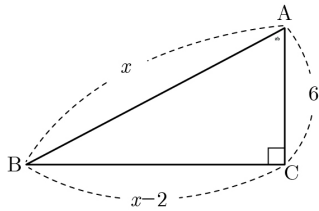
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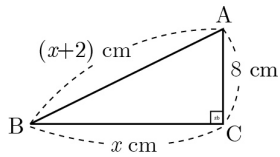
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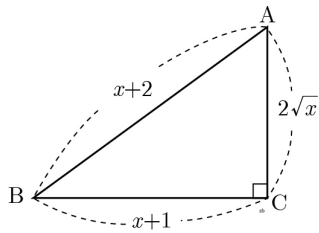
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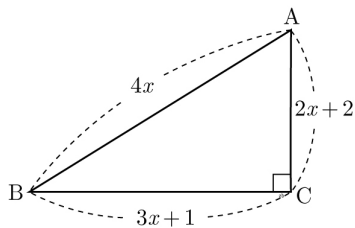
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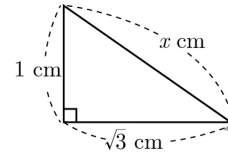


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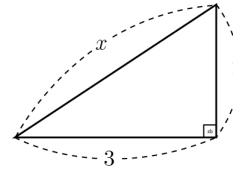


■ 다음 직각삼각형에서 x 의 값을 구하여라.

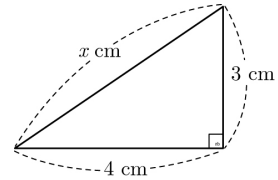
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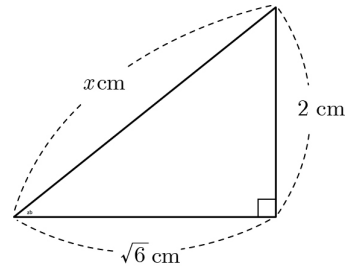
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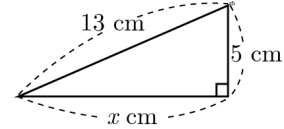
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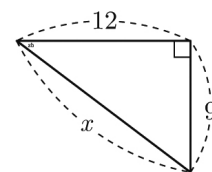
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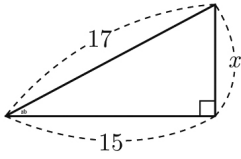
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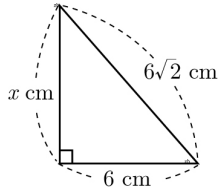
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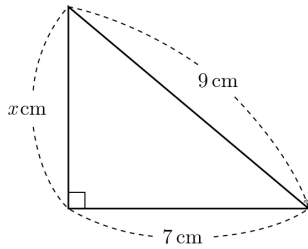
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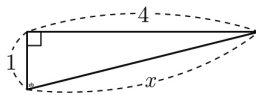
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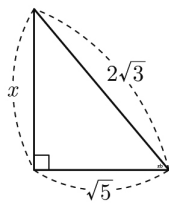
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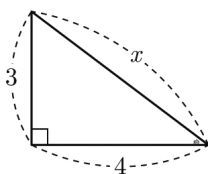
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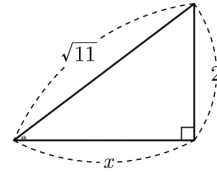
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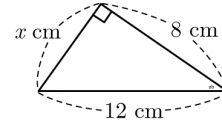
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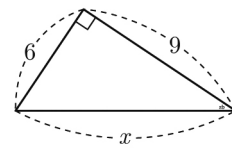
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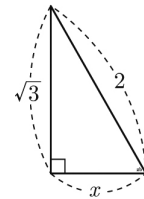
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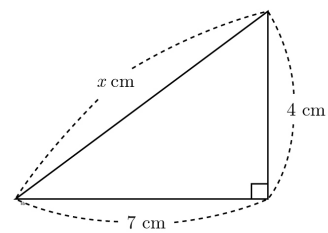
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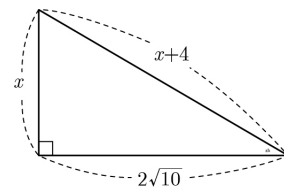
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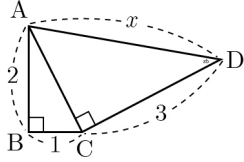
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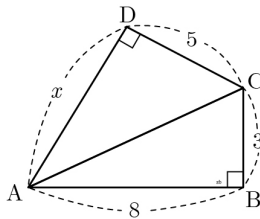
2개 이상의 직각삼각형의 변의 길이

다음 그림에서 x 의 값을 구하여라.

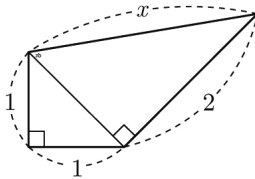
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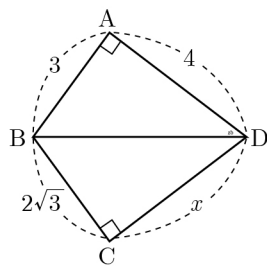
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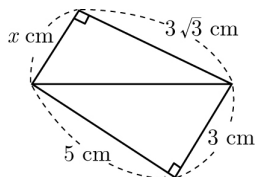
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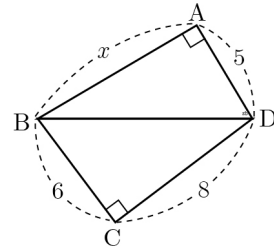
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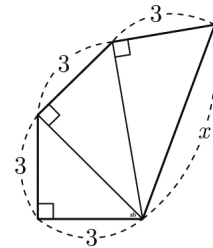
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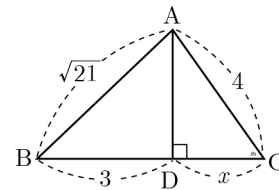
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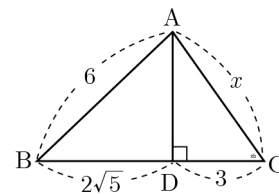
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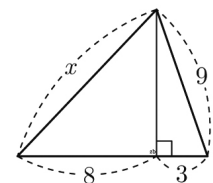
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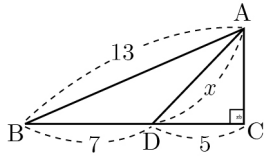
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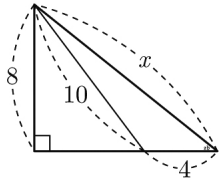
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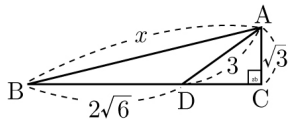
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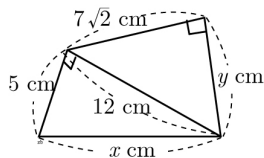


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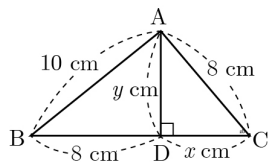


▣ 다음 그림에서 x , y 의 값을 각각 구하여라.

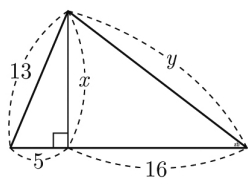
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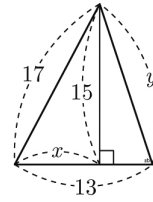
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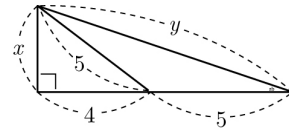
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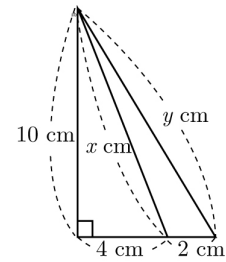
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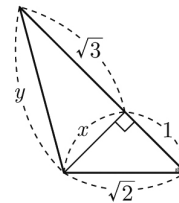
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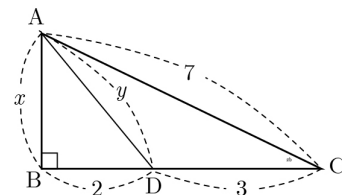
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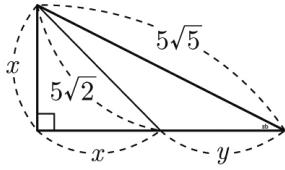
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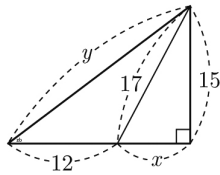
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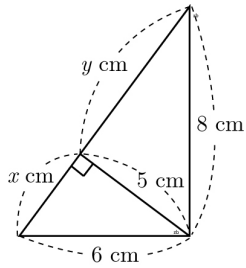
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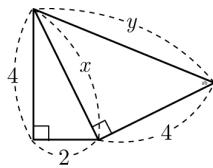
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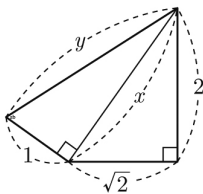
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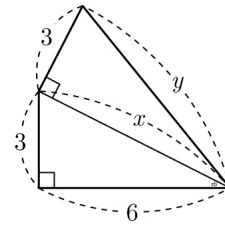
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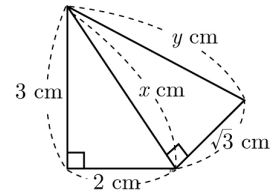
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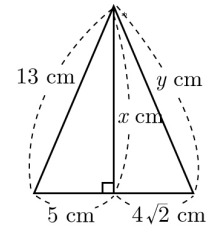
66.



67.



68.



정답 및 해설



1) 17

$$\Rightarrow x = \sqrt{8^2 + 15^2} = \sqrt{289} = 17$$

2) 12

$$\Rightarrow x = \sqrt{13^2 - 5^2} = \sqrt{144} = 12$$

3) 7

$$\Rightarrow x = \sqrt{25^2 - 24^2} = \sqrt{49} = 7$$

4) $2\sqrt{10}$

$$\Rightarrow \text{직각삼각형 ABC에서 } x = \sqrt{8^2 - (\sqrt{24})^2} = 2\sqrt{10}$$

5) $3\sqrt{3}$

$$\Rightarrow x = \sqrt{6^2 - 3^2} = 3\sqrt{3}$$

6) $\sqrt{3}$

$$\Rightarrow \text{직각삼각형 ABC에서 } x = \sqrt{3^2 - (\sqrt{6})^2} = \sqrt{3}$$

7) 2

$$\Rightarrow x = \sqrt{(\sqrt{13})^2 - 3^2} = \sqrt{4} = 2$$

8) $\sqrt{11}$

$$\Rightarrow x = \sqrt{5^2 - (\sqrt{14})^2} = \sqrt{11}$$

9) 10

$$\Rightarrow x = \sqrt{8^2 + 6^2} = \sqrt{100} = 10$$

10) $\sqrt{65}$

$$\Rightarrow \text{직각삼각형 ABC에서 } x = \sqrt{7^2 + 4^2} = \sqrt{65}$$

11) 10

$$\Rightarrow x = \sqrt{6^2 + 8^2} = 10$$

12) $2\sqrt{5}$

$$\Rightarrow x = \sqrt{6^2 - 4^2} = 2\sqrt{5}$$

13) $\frac{\sqrt{13}}{2}$

$$\Rightarrow (2x)^2 = 2^2 + 3^2$$

$$4x^2 = 13 \quad \therefore x = \frac{\sqrt{13}}{2}$$

14) 6

$$\Rightarrow \begin{aligned} (x+4)^2 &= x^2 + 8^2 \\ 8x &= 48 \quad \therefore x = 6 \end{aligned}$$

15) 5

$$\begin{aligned} \Rightarrow (2x+3)^2 &= x^2 + (x+7)^2, \quad 4x^2 + 12x + 9 = x^2 + x^2 + 14x + 49 \\ 2x^2 - 2x - 40 &= 0, \quad x^2 - x - 20 = 0, \quad (x-5)(x+4) = 0 \\ x > 0 \text{이므로 } x &= 5 \text{가 된다.} \end{aligned}$$

16) 10

$$\Rightarrow x^2 = (x-2)^2 + 6^2$$

$$4x = 40 \quad \therefore x = 10$$

17) 8

$$\Rightarrow \begin{aligned} (x+2)^2 &= x^2 + 6^2, \quad 4x = 32 \\ \therefore x &= 8 \end{aligned}$$

18) 10

19) 15

$$\begin{aligned} \Rightarrow \text{직각삼각형 ABC에서} \\ x^2 + 8^2 &= (x+2)^2, \quad 4x = 60 \quad \therefore x = 15 \end{aligned}$$

20) $\frac{3}{2}$

$$\begin{aligned} \Rightarrow \text{직각삼각형 ABC에서} \\ (x+2)^2 &= (x+1)^2 + (2\sqrt{x})^2 \\ x^2 + 4x + 4 &= x^2 + 2x + 1 + 4x \\ 2x &= 3 \quad \therefore x = \frac{3}{2} \end{aligned}$$

21) 5

22) 2

$$\Rightarrow x^2 = 1^2 + (\sqrt{3})^2 = 4 \quad \therefore x = 2$$

23) $\sqrt{13}$

$$\Rightarrow \text{피타고라스 정리에 의해 } x = \sqrt{3^2 + 2^2} = \sqrt{13}$$

24) 5

$$\Rightarrow \text{피타고라스 정리에 의해 } x = \sqrt{4^2 + 3^2} = 5$$

25) $\sqrt{10}$

$$\begin{aligned} \Rightarrow \text{직각삼각형에서 } x^2 &= (\sqrt{6})^2 + 2^2 \\ x^2 &= 10 \quad \therefore x = \sqrt{10} \end{aligned}$$

26) 12

$$\Rightarrow 13^2 = x^2 + 5^2, \quad x^2 = 144 \quad \therefore x = 12$$

27) 15

$$\Rightarrow 12^2 + 9^2 = x^2 \quad \therefore x = 15 (x > 0)$$

28) 8

$$\Rightarrow 15^2 + x^2 = 17^2 \quad \therefore x = 8 (x > 0)$$

29) 6

$$\Rightarrow (6\sqrt{2})^2 = x^2 + 6^2, \quad x^2 = 36 \quad \therefore x = 6$$

30) $4\sqrt{2}$

⇒ 직각삼각형에서 피타고라스 정리에 의해
 $x = \sqrt{9^2 - 7^2} = 4\sqrt{2}$

31) $\sqrt{17}$

⇒ $1^2 + 4^2 = x^2 \therefore x = \sqrt{17} (x > 0)$

32) $\sqrt{7}$

⇒ $x^2 + (\sqrt{5})^2 = (2\sqrt{3})^2 \therefore x = \sqrt{7} (x > 0)$

33) 5

⇒ 피타고라스의 정리에 의하여

$$3^2 + 4^2 = x^2 \quad \therefore x = 5 (x > 0)$$

34) $\sqrt{7}$

⇒ $x^2 + 2^2 = (\sqrt{11})^2 \quad \therefore x = \sqrt{7} (x > 0)$

35) $4\sqrt{5}$

⇒ $x = \sqrt{12^2 - 8^2} = 4\sqrt{5}$

36) $3\sqrt{13}$

⇒ $6^2 + 9^2 = x^2 \quad \therefore x = 3\sqrt{13} (x > 0)$

37) 1

⇒ $(\sqrt{3})^2 + x^2 = 2^2 \quad \therefore x = 1 (x > 0)$

38) $\sqrt{65}$

⇒ $x = \sqrt{7^2 + 4^2} = \sqrt{49 + 16} = \sqrt{65}$

39) 3

⇒ $x^2 + (2\sqrt{10})^2 = (x+4)^2$

$$8x + 16 = 40, \quad 8x = 24 \quad \therefore x = 3$$

40) $\sqrt{14}$

⇒ $\triangle ABC$ 에서 $\overline{AC} = \sqrt{1^2 + 2^2} = \sqrt{5}$

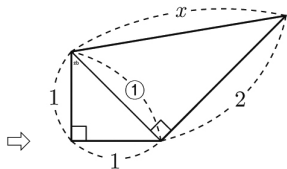
$\triangle ACD$ 에서 $x = \sqrt{3^2 + (\sqrt{5})^2} = \sqrt{14}$

41) $4\sqrt{3}$

⇒ $\overline{AC} = \sqrt{x^2 + 5^2} = \sqrt{8^2 + 3^2}$

$$x^2 + 25 = 73, \quad x^2 = 48 \quad \therefore x = 4\sqrt{3}$$

42) $\sqrt{6}$



$$\textcircled{1} = \sqrt{1^2 + 1^2} = \sqrt{2} \quad \therefore x = \sqrt{(\sqrt{2})^2 + 2^2} = \sqrt{6}$$

43) $\sqrt{13}$

⇒ $\triangle ABD$ 에서 $\overline{BD} = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$

$\triangle BCD$ 에서 $x = \sqrt{5^2 - (2\sqrt{3})^2} = \sqrt{13}$

44) $x = \sqrt{7}$

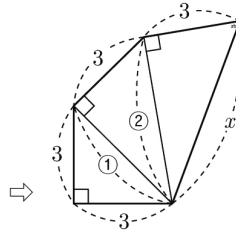
⇒ $x^2 + (3\sqrt{3})^2 = 5^2 + 3^2, \quad x^2 = 7 \quad \therefore x = \sqrt{7}$

45) $5\sqrt{3}$

⇒ $\triangle BCD$ 에서 $\overline{BD} = \sqrt{6^2 + 8^2} = \sqrt{100} = 10$

$\triangle ABD$ 에서 $x = \sqrt{10^2 - 5^2} = \sqrt{75} = 5\sqrt{3}$

46) 6



$$\textcircled{1} = \sqrt{3^2 + 3^2} = 3\sqrt{2} \quad \textcircled{2} = \sqrt{(3\sqrt{2})^2 + 3^2} = 3\sqrt{3}$$

$$\therefore x = \sqrt{(3\sqrt{3})^2 + 3^2} = 6$$

47) 2

⇒ $\triangle ABD$ 에서 $\overline{AD} = \sqrt{(\sqrt{21})^2 - 3^2} = \sqrt{12} = 2\sqrt{3}$

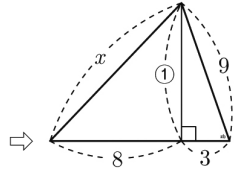
$\triangle ACD$ 에서 $x = \sqrt{4^2 - (2\sqrt{3})^2} = \sqrt{4} = 2$

48) 5

⇒ $\triangle ABD$ 에서 $\overline{AD} = \sqrt{6^2 - (2\sqrt{5})^2} = \sqrt{16} = 4$

$\triangle ACD$ 에서 $x = \sqrt{3^2 + 4^2} = \sqrt{25} = 5$

49) $2\sqrt{34}$



$$\textcircled{1} = \sqrt{9^2 - 3^2} = 6\sqrt{2}$$

$$\therefore x = \sqrt{(6\sqrt{2})^2 + 8^2} = 2\sqrt{34}$$

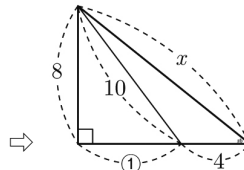
50) $5\sqrt{2}$

⇒ $\overline{BC} = 7 + 5 = 12$ 이므로

$\triangle ABC$ 에서 $\overline{AC} = \sqrt{13^2 - 12^2} = \sqrt{25} = 5$

$\triangle ACD$ 에서 $x = \sqrt{5^2 + 5^2} = \sqrt{50} = 5\sqrt{2}$

51) $2\sqrt{41}$



$$\textcircled{1} = \sqrt{10^2 - 8^2} = 6 \quad \therefore x = \sqrt{(6+4)^2 + 8^2} = 2\sqrt{41}$$

$$52) \sqrt{57}$$

$$\Rightarrow \triangle ACD \text{에서 } \overline{CD} = \sqrt{3^2 - (\sqrt{3})^2} = \sqrt{6}$$

$$\overline{BC} = 2\sqrt{6} + \sqrt{6} = 3\sqrt{6} \text{이므로}$$

$$\triangle ABC \text{에서 } x = \sqrt{(3\sqrt{6})^2 + (\sqrt{3})^2} = \sqrt{57}$$

$$53) x = 13, y = \sqrt{46}$$

$$\Rightarrow x = \sqrt{5^2 + 12^2} = 13, y = \sqrt{12^2 - (7\sqrt{2})^2} = \sqrt{46}$$

$$54) x = 2\sqrt{7}, y = 6$$

$$\Rightarrow \triangle ADB \text{에서 } y = \sqrt{10^2 - 8^2} = 6$$

$$\triangle ADC \text{에서 } x = \sqrt{8^2 - 6^2} = 2\sqrt{7}$$

$$55) x = 12, y = 20$$

$$\Rightarrow x = \sqrt{13^2 - 5^2} = \sqrt{144} = 12$$

$$y = \sqrt{12^2 + 16^2} = \sqrt{400} = 20$$

$$56) x = 8, y = 5\sqrt{10}$$

$$\Rightarrow x = \sqrt{17^2 - 15^2} = \sqrt{64} = 8$$

$$y = \sqrt{(13-8)^2 + 15^2} = \sqrt{250} = 5\sqrt{10}$$

$$57) x = 3, y = 3\sqrt{10}$$

$$\Rightarrow x = \sqrt{5^2 - 4^2} = \sqrt{9} = 3$$

$$y = \sqrt{(4+5)^2 + 3^2} = 3\sqrt{10}$$

$$58) x = 2\sqrt{29}, y = 2\sqrt{34}$$

$$\Rightarrow x = \sqrt{10^2 + 4^2} = 2\sqrt{29}, y = \sqrt{10^2 + (4+2)^2} = 2\sqrt{34}$$

$$59) x = 1, y = 2$$

$$\Rightarrow x = \sqrt{(\sqrt{2})^2 - 1^2} = 1$$

$$y = \sqrt{(\sqrt{3})^2 + 1^2} = \sqrt{4} = 2$$

$$60) x = 2\sqrt{6}, y = 2\sqrt{7}$$

$$\Rightarrow \text{직각삼각형 } ABC \text{에서 } x = \sqrt{7^2 - 5^2} = 2\sqrt{6}$$

$$\text{직각삼각형 } ABD \text{에서 } y = \sqrt{2^2 + (2\sqrt{6})^2} = 2\sqrt{7}$$

$$61) x = 5, y = 5$$

$$\Rightarrow x^2 + x^2 = (5\sqrt{2})^2, x^2 = 25 \quad \therefore x = 5 (x > 0)$$

$$(5+y)^2 + 5^2 = (5\sqrt{5})^2, (5+y)^2 = 100,$$

$$5+y = 10 \quad \therefore y = 5 (y > 0)$$

$$62) x = 8, y = 25$$

$$\Rightarrow x = \sqrt{17^2 - 15^2} = \sqrt{64} = 8$$

$$y = \sqrt{(12+8)^2 + 15^2} = \sqrt{625} = 25$$

$$63) x = \sqrt{11}, y = \sqrt{39}$$

$$\Rightarrow x = \sqrt{6^2 - 5^2} = \sqrt{11}, y = \sqrt{8^2 - 5^2} = \sqrt{39}$$

$$64) x = 2\sqrt{5}, y = 6$$

$$\Rightarrow x = \sqrt{2^2 + 4^2} = \sqrt{20} = 2\sqrt{5}$$

$$y = \sqrt{4^2 + (2\sqrt{5})^2} = \sqrt{36} = 6$$

$$65) x = \sqrt{6}, y = \sqrt{7}$$

$$\Rightarrow x = \sqrt{(\sqrt{2})^2 + 2^2} = \sqrt{6}$$

$$y = \sqrt{1^2 + (\sqrt{6})^2} = \sqrt{7}$$

$$66) x = 3\sqrt{5}, y = 3\sqrt{6}$$

$$\Rightarrow x = \sqrt{6^2 + 3^2} = \sqrt{45} = 3\sqrt{5}$$

$$y = \sqrt{(3\sqrt{5})^2 + 3^2} = \sqrt{54} = 3\sqrt{6}$$

$$67) x = \sqrt{13}, y = 4$$

$$\Rightarrow x = \sqrt{3^2 + 2^2} = \sqrt{13}, y = \sqrt{(\sqrt{13})^2 + (\sqrt{3})^2} = 4$$

$$68) x = 12, y = 4\sqrt{11}$$

$$\Rightarrow x = \sqrt{13^2 - 5^2} = 12, y = \sqrt{12^2 + (4\sqrt{2})^2} = 4\sqrt{11}$$