



계산력 연습

중 3 과정

[영역] 1.수와 연산

1-3-1.근호 안을 간단히 하기



◇ 「콘텐츠산업 진흥법 시행령」 제33조에 의한 표시

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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. 근호 안을 간단히 하기

(1) 근호 안의 제곱인 인수는 근호 밖으로 빼낼 수 있다.

$$\sqrt{a^2b} = a\sqrt{b}, \quad \sqrt{\frac{b}{a^2}} = \frac{\sqrt{b}}{a} \quad (\text{단, } a > 0, b > 0)$$

(2) 근호 밖의 양수는 제곱하여 근호 안으로 넣을 수 있다.

$$a\sqrt{b} = \sqrt{a^2b} \quad (\text{단, } a > 0, b > 0)$$

💬 근호 안을 간단히 할 때, 유의점

● 부호에 유의하여 계산한다.

$$-2\sqrt{5} = \begin{cases} \sqrt{(-2)^2 \times 5} = \sqrt{20} & (\times) \\ -\sqrt{2^2 \times 5} = -\sqrt{20} & (\bigcirc) \end{cases}$$



근호 안의 수를 밖으로 빼내기

▣ 다음 수를 근호 안의 수가 가장 작은 자연수가 되도록 $a\sqrt{b}$ 의 꼴로 나타내어라.

1. $\sqrt{12}$

2. $\sqrt{27}$

3. $\sqrt{48}$

4. $\sqrt{50}$

5. $\sqrt{72}$

6. $\sqrt{80}$

7. $\sqrt{99}$

8. $\sqrt{112}$

9. $\sqrt{128}$

10. $\sqrt{180}$

11. $\sqrt{243}$

12. $\sqrt{1000}$

13. $\sqrt{18}$

14. $\sqrt{75}$

15. $\sqrt{240}$

16. $2\sqrt{48}$

17. $-\sqrt{98}$

18. $\sqrt{52}$



19. $-\sqrt{108}$

20. $\sqrt{162}$

21. $-\sqrt{320}$

22. $-\sqrt{50}$

23. $\sqrt{125}$

24. $\sqrt{384}$

25. $\sqrt{63}$

26. $\sqrt{112}$

27. $\sqrt{192}$

28. $\sqrt{54}$

29. $\sqrt{147}$

30. $-\sqrt{252}$

31. $\sqrt{117}$

32. $-\sqrt{343}$

■ 다음을 $\frac{\sqrt{b}}{a}$ 의 꼴로 나타내어라.

33. $-\sqrt{0.05}$

34. $\sqrt{0.24}$

35. $\sqrt{0.0005}$

36. $\sqrt{3.38}$

37. $\sqrt{0.28}$

38. $\sqrt{6.48}$

39. $\sqrt{0.48}$

40. $\sqrt{0.0018}$

41. $\sqrt{\frac{21}{400}}$

42. $\sqrt{\frac{3}{25}}$

43. $\sqrt{\frac{6}{27}}$

44. $-\sqrt{\frac{10}{8}}$

45. $-\sqrt{\frac{28}{64}}$



근호 밖의 수를 안으로 넣기

■ 다음 수를 \sqrt{a} 또는 $-\sqrt{a}$ 의 꼴로 나타내어라.

46. $\sqrt{\frac{3}{4}}$

47. $\sqrt{0.11}$

48. $\sqrt{\frac{5}{16}}$

49. $\sqrt{\frac{7}{25}}$

50. $\sqrt{\frac{3}{100}}$

51. $\sqrt{\frac{10}{18}}$

52. $\sqrt{\frac{14}{72}}$

53. $\sqrt{\frac{11}{36}}$

54. $\sqrt{\frac{13}{81}}$

55. $-\sqrt{\frac{7}{64}}$

56. $\sqrt{\frac{19}{100}}$

57. $2\sqrt{11}$

58. $3\sqrt{5}$

59. $5\sqrt{2}$

60. $-3\sqrt{7}$

61. $2\sqrt{21}$

62. $4\sqrt{6}$

63. $-7\sqrt{2}$

64. $6\sqrt{3}$

65. $3\sqrt{15}$

66. $5\sqrt{7}$

67. $12\sqrt{2}$

68. $10\sqrt{3}$

69. $3\sqrt{2}$

70. $2\sqrt{6}$

71. $-3\sqrt{7}$

72. $-6\sqrt{10}$

73. $4\sqrt{11}$

■ 다음을 $\sqrt{\frac{b}{a}}$ 의 꼴로 나타내어라.

74. $\frac{\sqrt{5}}{3}$

75. $\frac{\sqrt{2}}{5}$

76. $\frac{\sqrt{7}}{4}$

77. $\frac{\sqrt{13}}{10}$

78. $\frac{\sqrt{12}}{2}$

79. $\frac{2\sqrt{21}}{3}$

80. $\frac{\sqrt{5}}{4}$

81. $\frac{\sqrt{6}}{7}$

82. $-\frac{\sqrt{7}}{10}$

83. $\frac{\sqrt{20}}{2}$

84. $-\frac{\sqrt{75}}{5}$

85. $\frac{2\sqrt{2}}{3}$

86. $\frac{\sqrt{3}}{4}$

87. $\frac{\sqrt{8}}{2}$

88. $-\frac{\sqrt{6}}{7}$

89. $-\frac{\sqrt{18}}{3}$

90. $\frac{3\sqrt{3}}{4}$

91. $\frac{\sqrt{12}}{3}$

92. $-\frac{\sqrt{14}}{7}$

93. $\frac{\sqrt{18}}{6}$

정답 및 해설



1) $2\sqrt{3}$

$\Rightarrow \sqrt{12} = \sqrt{2^2 \times 3} = 2\sqrt{3}$

2) $3\sqrt{3}$

$\Rightarrow \sqrt{27} = \sqrt{3^2 \times 3} = 3\sqrt{3}$

3) $4\sqrt{3}$

$\Rightarrow \sqrt{48} = \sqrt{4^2 \times 3} = 4\sqrt{3}$

4) $5\sqrt{2}$

$\Rightarrow \sqrt{50} = \sqrt{5^2 \times 2} = 5\sqrt{2}$

5) $6\sqrt{2}$

$\Rightarrow \sqrt{72} = \sqrt{6^2 \times 2} = 6\sqrt{2}$

6) $4\sqrt{5}$

$\Rightarrow \sqrt{80} = \sqrt{4^2 \times 5} = 4\sqrt{5}$

7) $3\sqrt{11}$

$\Rightarrow \sqrt{99} = \sqrt{3^2 \times 11} = 3\sqrt{11}$

8) $4\sqrt{7}$

$\Rightarrow \sqrt{112} = \sqrt{4^2 \times 7} = 4\sqrt{7}$

9) $8\sqrt{2}$

$\Rightarrow \sqrt{128} = \sqrt{8^2 \times 2} = 8\sqrt{2}$

10) $6\sqrt{5}$

$\Rightarrow \sqrt{180} = \sqrt{6^2 \times 5} = 6\sqrt{5}$

11) $9\sqrt{3}$

$\Rightarrow \sqrt{243} = \sqrt{9^2 \times 3} = 9\sqrt{3}$

12) $10\sqrt{10}$

$\Rightarrow \sqrt{1000} = \sqrt{10^2 \times 10} = 10\sqrt{10}$

13) $3\sqrt{2}$

14) $5\sqrt{3}$

$\Rightarrow \sqrt{75} = \sqrt{3 \times 5^2} = 5\sqrt{3}$

15) $4\sqrt{15}$

$\Rightarrow \sqrt{240} = \sqrt{2^4 \times 3 \times 5} = 4\sqrt{15}$

16) $8\sqrt{3}$

$\Rightarrow 2\sqrt{48} = 2 \times \sqrt{3 \times 4^2} = 2 \times 4\sqrt{3} = 8\sqrt{3}$

17) $-7\sqrt{2}$

$\Rightarrow -\sqrt{98} = -\sqrt{2 \times 7^2} = -7\sqrt{2}$

18) $2\sqrt{13}$

$\Rightarrow \sqrt{52} = \sqrt{2^2 \times 13} = 2\sqrt{13}$

19) $-6\sqrt{3}$

$\Rightarrow -\sqrt{108} = -\sqrt{6^2 \times 3} = -6\sqrt{3}$

20) $9\sqrt{2}$

$\Rightarrow \sqrt{162} = \sqrt{3^4 \times 2} = 9\sqrt{2}$

21) $-8\sqrt{5}$

$\Rightarrow -\sqrt{320} = -\sqrt{8^2 \times 5} = -8\sqrt{5}$

22) $-5\sqrt{2}$

$\Rightarrow -\sqrt{50} = -\sqrt{5^2 \times 2} = -5\sqrt{2}$

23) $5\sqrt{5}$

$\Rightarrow \sqrt{125} = \sqrt{5^2 \times 5} = 5\sqrt{5}$

24) $8\sqrt{6}$

$\Rightarrow \sqrt{384} = \sqrt{8^2 \times 6} = 8\sqrt{6}$

25) $3\sqrt{7}$

$\Rightarrow \sqrt{63} = \sqrt{3^2 \times 7} = 3\sqrt{7}$

26) $4\sqrt{7}$

$\Rightarrow \sqrt{112} = \sqrt{4^2 \times 7} = 4\sqrt{7}$

27) $8\sqrt{3}$

$\Rightarrow \sqrt{192} = \sqrt{8^2 \times 3} = 8\sqrt{3}$

28) $3\sqrt{6}$

29) $7\sqrt{3}$

30) $-6\sqrt{7}$

31) $3\sqrt{13}$

32) $-7\sqrt{7}$

33) $-\frac{\sqrt{5}}{10}$

$\Rightarrow -\sqrt{0.05} = -\sqrt{\frac{5}{100}} = -\sqrt{\frac{5}{10^2}} = -\frac{\sqrt{5}}{10}$

34) $\frac{\sqrt{6}}{5}$

$$\Rightarrow \sqrt{0.24} = \sqrt{\frac{24}{100}} = \sqrt{\frac{2^2 \times 6}{10^2}} = \frac{2\sqrt{6}}{10} = \frac{\sqrt{6}}{5}$$

$$35) \frac{\sqrt{5}}{100}$$

$$\Rightarrow \sqrt{0.0005} = \sqrt{\frac{5}{10000}} = \frac{\sqrt{5}}{100}$$

$$36) \frac{13}{10} \sqrt{2}$$

$$\Rightarrow \sqrt{3.38} = \sqrt{\frac{338}{100}} = \sqrt{\frac{2 \times 13^2}{10^2}} = \frac{13}{10} \sqrt{2}$$

$$37) \frac{\sqrt{7}}{5}$$

$$\Rightarrow \sqrt{0.28} = \sqrt{\frac{28}{100}} = \sqrt{\frac{2^2 \times 7}{10^2}} = \frac{2}{10} \sqrt{7} = \frac{1}{5} \sqrt{7}$$

$$38) \frac{9}{5} \sqrt{2}$$

$$\Rightarrow \sqrt{6.48} = \sqrt{\frac{648}{100}} = \sqrt{\frac{18^2 \times 2}{10^2}} = \frac{18}{10} \sqrt{2} = \frac{9}{5} \sqrt{2}$$

$$39) \frac{2}{5} \sqrt{3}$$

$$40) \frac{3}{100} \sqrt{2}$$

$$41) \frac{\sqrt{21}}{20}$$

$$42) \frac{\sqrt{3}}{5}$$

$$\Rightarrow \sqrt{\frac{3}{25}} = \frac{\sqrt{3}}{\sqrt{25}} = \frac{\sqrt{3}}{\sqrt{5^2}} = \frac{\sqrt{3}}{5}$$

$$43) \frac{\sqrt{2}}{3}$$

$$\Rightarrow \sqrt{\frac{6}{27}} = \sqrt{\frac{2}{9}} = \frac{\sqrt{2}}{\sqrt{3^2}} = \frac{\sqrt{2}}{3}$$

$$44) -\frac{\sqrt{5}}{2}$$

$$\Rightarrow -\sqrt{\frac{10}{8}} = -\sqrt{\frac{5}{4}} = -\frac{\sqrt{5}}{\sqrt{2^2}} = -\frac{\sqrt{5}}{2}$$

$$45) -\frac{\sqrt{7}}{4}$$

$$\Rightarrow -\sqrt{\frac{28}{64}} = -\sqrt{\frac{7}{16}} = -\frac{\sqrt{7}}{\sqrt{4^2}} = -\frac{\sqrt{7}}{4}$$

$$46) \frac{\sqrt{3}}{2}$$

$$\Rightarrow \sqrt{\frac{3}{4}} = \frac{\sqrt{3}}{\sqrt{4}} = \frac{\sqrt{3}}{\sqrt{2^2}} = \frac{\sqrt{3}}{2}$$

$$47) \frac{\sqrt{11}}{10}$$

$$\Rightarrow \sqrt{0.11} = \sqrt{\frac{11}{100}} = \frac{\sqrt{11}}{\sqrt{10^2}} = \frac{\sqrt{11}}{10}$$

$$48) \frac{\sqrt{5}}{4}$$

$$\Rightarrow \sqrt{\frac{5}{16}} = \frac{\sqrt{5}}{\sqrt{16}} = \frac{\sqrt{5}}{\sqrt{4^2}} = \frac{\sqrt{5}}{4}$$

$$49) \frac{\sqrt{7}}{5}$$

$$\Rightarrow \sqrt{\frac{7}{25}} = \sqrt{\frac{7}{5^2}} = \frac{\sqrt{7}}{5}$$

$$50) \frac{\sqrt{3}}{10}$$

$$\Rightarrow \sqrt{\frac{3}{100}} = \sqrt{\frac{3}{10^2}} = \frac{\sqrt{3}}{10}$$

$$51) \frac{\sqrt{5}}{3}$$

$$\Rightarrow \sqrt{\frac{10}{18}} = \sqrt{\frac{5}{9}} = \sqrt{\frac{5}{3^2}} = \frac{\sqrt{5}}{3}$$

$$52) \frac{\sqrt{7}}{6}$$

$$\Rightarrow \sqrt{\frac{14}{72}} = \sqrt{\frac{7}{36}} = \sqrt{\frac{7}{6^2}} = \frac{\sqrt{7}}{6}$$

$$53) \frac{\sqrt{11}}{6}$$

$$\Rightarrow \sqrt{\frac{11}{36}} = \sqrt{\frac{11}{6^2}} = \frac{\sqrt{11}}{6}$$

$$54) \frac{\sqrt{13}}{9}$$

$$\Rightarrow \sqrt{\frac{13}{81}} = \sqrt{\frac{13}{9^2}} = \frac{\sqrt{13}}{9}$$

$$55) -\frac{\sqrt{7}}{8}$$

$$\Rightarrow -\sqrt{\frac{7}{64}} = -\sqrt{\frac{7}{8^2}} = -\frac{\sqrt{7}}{8}$$

$$56) \frac{\sqrt{19}}{10}$$

$$\Rightarrow \sqrt{\frac{19}{100}} = \sqrt{\frac{19}{10^2}} = \frac{\sqrt{19}}{10}$$

$$57) \sqrt{44}$$

$$\Rightarrow 2\sqrt{11} = \sqrt{2^2 \times 11} = \sqrt{44}$$

$$58) \sqrt{45}$$

$$\Rightarrow 3\sqrt{5} = \sqrt{3^2 \times 5} = \sqrt{45}$$

$$59) \sqrt{50}$$

$$\Rightarrow 5\sqrt{2} = \sqrt{5^2 \times 2} = \sqrt{50}$$

$$60) -\sqrt{63}$$

$$\Rightarrow -3\sqrt{7} = -\sqrt{3^2 \times 7} = -\sqrt{63}$$

$$61) \sqrt{84}$$

$$\Rightarrow 2\sqrt{21} = \sqrt{2^2 \times 21} = \sqrt{84}$$

$$62) \sqrt{96}$$

$$\Rightarrow 4\sqrt{6} = \sqrt{4^2 \times 6} = \sqrt{96}$$

$$63) -\sqrt{98}$$

$$\Rightarrow -7\sqrt{2} = -\sqrt{7^2 \times 2} = -\sqrt{98}$$

$$64) \sqrt{108}$$

$$\Rightarrow 6\sqrt{3} = \sqrt{6^2 \times 3} = \sqrt{108}$$

$$65) \sqrt{135}$$

$$\Rightarrow 3\sqrt{15} = \sqrt{3^2 \times 15} = \sqrt{135}$$

$$66) \sqrt{175}$$

$$\Rightarrow 5\sqrt{7} = \sqrt{5^2 \times 7} = \sqrt{175}$$

$$67) \sqrt{288}$$

$$\Rightarrow 12\sqrt{2} = \sqrt{12^2 \times 2} = \sqrt{288}$$

$$68) \sqrt{300}$$

$$\Rightarrow 10\sqrt{3} = \sqrt{10^2 \times 3} = \sqrt{300}$$

$$69) \sqrt{18}$$

$$\Rightarrow 3\sqrt{2} = \sqrt{3^2 \times 2} = \sqrt{18}$$

$$70) \sqrt{24}$$

$$\Rightarrow 2\sqrt{6} = \sqrt{2^2 \times 6} = \sqrt{24}$$

$$71) -\sqrt{63}$$

$$\Rightarrow -3\sqrt{7} = -\sqrt{3^2 \times 7} = -\sqrt{63}$$

$$72) -\sqrt{360}$$

$$\Rightarrow -6\sqrt{10} = -\sqrt{6^2 \times 10} = -\sqrt{360}$$

$$73) \sqrt{176}$$

$$\Rightarrow 4\sqrt{11} = \sqrt{4^2 \times 11} = \sqrt{176}$$

$$74) \sqrt{\frac{5}{9}}$$

$$\Rightarrow \frac{\sqrt{5}}{3} = \frac{\sqrt{5}}{\sqrt{3^2}} = \frac{\sqrt{5}}{\sqrt{9}} = \sqrt{\frac{5}{9}}$$

$$75) \sqrt{\frac{2}{25}}$$

$$\Rightarrow \frac{\sqrt{2}}{5} = \frac{\sqrt{2}}{\sqrt{5^2}} = \frac{\sqrt{2}}{\sqrt{25}} = \sqrt{\frac{2}{25}}$$

$$76) \sqrt{\frac{7}{16}}$$

$$77) \sqrt{\frac{13}{100}}$$

$$\Rightarrow \frac{\sqrt{13}}{10} = \frac{\sqrt{13}}{\sqrt{10^2}} = \frac{\sqrt{13}}{\sqrt{100}} = \sqrt{\frac{13}{100}}$$

$$78) \sqrt{3}$$

$$\Rightarrow \frac{\sqrt{12}}{2} = \sqrt{\frac{12}{2^2}} = \sqrt{\frac{12}{4}} = \sqrt{3}$$

$$79) \sqrt{\frac{28}{3}}$$

$$\Rightarrow \frac{2\sqrt{21}}{3} = \sqrt{\left(\frac{2}{3}\right)^2 \times 21} = \sqrt{\frac{28}{3}}$$

$$80) \sqrt{\frac{5}{16}}$$

$$\Rightarrow \frac{\sqrt{5}}{4} = \sqrt{\frac{5}{4^2}} = \sqrt{\frac{5}{16}}$$

$$81) \sqrt{\frac{6}{49}}$$

$$\Rightarrow \frac{\sqrt{6}}{7} = \sqrt{\frac{6}{7^2}} = \sqrt{\frac{6}{49}}$$

$$82) -\sqrt{\frac{7}{100}}$$

$$\Rightarrow -\frac{\sqrt{7}}{10} = -\sqrt{\frac{7}{10^2}} = -\sqrt{\frac{7}{100}}$$

$$83) \sqrt{5}$$

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

$$84) -\sqrt{3}$$

$$\Rightarrow -\frac{\sqrt{75}}{5} = -\sqrt{\frac{75}{5^2}} = -\sqrt{\frac{75}{25}} = -\sqrt{3}$$

$$85) \sqrt{\frac{8}{9}}$$

$$\Rightarrow \frac{2\sqrt{2}}{3} = \sqrt{\frac{2^2 \times 2}{3^2}} = \sqrt{\frac{8}{9}}$$

$$86) \sqrt{\frac{3}{16}}$$

$$\Rightarrow \frac{\sqrt{3}}{4} = \sqrt{\frac{3}{4^2}} = \sqrt{\frac{3}{16}}$$

$$87) \sqrt{2}$$

$$\Rightarrow \frac{\sqrt{8}}{2} = \sqrt{\frac{8}{2^2}} = \sqrt{2}$$

$$88) -\sqrt{\frac{6}{49}}$$

$$\Rightarrow -\frac{\sqrt{6}}{7} = -\sqrt{\frac{6}{7^2}} = -\sqrt{\frac{6}{49}}$$

$$89) -\sqrt{2}$$

$$\Rightarrow -\frac{\sqrt{18}}{3} = -\sqrt{\frac{18}{3^2}} = -\sqrt{2}$$

$$90) \sqrt{\frac{27}{16}}$$

$$\Rightarrow \frac{3\sqrt{3}}{4} = \sqrt{\frac{3^2 \times 3}{4^2}} = \sqrt{\frac{27}{16}}$$

$$91) \sqrt{\frac{4}{3}}$$

$$\Rightarrow \frac{\sqrt{12}}{3} = \sqrt{\frac{12}{3^2}} = \sqrt{\frac{4}{3}}$$

$$92) -\sqrt{\frac{2}{7}}$$

$$\Rightarrow -\frac{\sqrt{14}}{7} = -\sqrt{\frac{14}{7^2}} = -\sqrt{\frac{2}{7}}$$

$$93) \sqrt{\frac{1}{2}}$$

$$\Rightarrow \frac{\sqrt{18}}{6} = \sqrt{\frac{18}{6^2}} = \sqrt{\frac{1}{2}}$$