계산시 참고사항

1. 근호 안을 간단히 하기

(1) 근호 안의 제곱인 인수는 근호 밖으로 빼낼 수 있다.

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

(2) 근호 밖의 양수는 제곱하여 근호 안으로 넣을 수 있다.

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

근호 안을 간단히 할 때, 유의점

◉ 부호에 유의하여 계산한다.

$$-2\sqrt{5}=\begin{cases}\sqrt{(-2)^2\times5}=\sqrt{20} & (\times)\\ -\sqrt{2^2\times5}=-\sqrt{20} & (\bigcirc)\end{cases}$$

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. $\sqrt{52}$

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

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

근호 밖의 수를 안으로 넣기

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

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) $2\sqrt{3}$
⇨ $\sqrt{12}=\sqrt{2^2\times3}=2\sqrt{3}$

2) $3\sqrt{3}$
⇨ $\sqrt{27}=\sqrt{3^2\times3}=3\sqrt{3}$

3) $4\sqrt{3}$
⇨ $\sqrt{48}=\sqrt{4^2\times3}=4\sqrt{3}$

4) $5\sqrt{2}$
⇨ $\sqrt{50}=\sqrt{5^2\times2}=5\sqrt{2}$

5) $6\sqrt{2}$
⇨ $\sqrt{72}=\sqrt{6^2\times2}=6\sqrt{2}$

6) $4\sqrt{5}$
⇨ $\sqrt{80}=\sqrt{4^2\times5}=4\sqrt{5}$

7) $3\sqrt{11}$
⇨ $\sqrt{99}=\sqrt{3^2\times11}=3\sqrt{11}$

8) $4\sqrt{7}$
⇨ $\sqrt{112}=\sqrt{4^2\times7}=4\sqrt{7}$

9) $8\sqrt{2}$
⇨ $\sqrt{128}=\sqrt{8^2\times2}=8\sqrt{2}$

10) $6\sqrt{5}$
⇨ $\sqrt{180}=\sqrt{6^2\times5}=6\sqrt{5}$

11) $9\sqrt{3}$
⇨ $\sqrt{243}=\sqrt{9^2\times3}=9\sqrt{3}$

12) $10\sqrt{10}$
⇨ $\sqrt{1000}=\sqrt{10^2\times10}=10\sqrt{10}$

13) $3\sqrt{2}$

14) $5\sqrt{3}$
⇨ $\sqrt{75}=\sqrt{3\times5^2}=5\sqrt{3}$

15) $4\sqrt{15}$
⇨ $\sqrt{240}=\sqrt{2^4\times3\times5}=4\sqrt{15}$

16) $8\sqrt{3}$
⇨ $2\sqrt{48}=2\times\sqrt{3\times4^2}=2\times4\sqrt{3}=8\sqrt{3}$

17) $-7\sqrt{2}$
⇨ $-\sqrt{98}=-\sqrt{2\times7^2}=-7\sqrt{2}$

18) $2\sqrt{13}$
⇨ $\sqrt{52}=\sqrt{2^2\times13}=2\sqrt{13}$

19) $-6\sqrt{3}$
⇨ $-\sqrt{108}=-\sqrt{6^2\times3}=-6\sqrt{3}$

20) $9\sqrt{2}$
⇨ $\sqrt{162}=\sqrt{3^4\times2}=9\sqrt{2}$

21) $-8\sqrt{5}$
⇨ $-\sqrt{320}=-\sqrt{8^2\times5}=-8\sqrt{5}$

22) $-5\sqrt{2}$
⇨ $-\sqrt{50}=-\sqrt{5^2\times2}=-5\sqrt{2}$

23) $5\sqrt{5}$
⇨ $\sqrt{125}=\sqrt{5^2\times5}=5\sqrt{5}$

24) $8\sqrt{6}$
⇨ $\sqrt{384}=\sqrt{8^2\times6}=8\sqrt{6}$

25) $3\sqrt{7}$
⇨ $\sqrt{63}=\sqrt{3^2\times7}=3\sqrt{7}$

26) $4\sqrt{7}$
⇨ $\sqrt{112}=\sqrt{4^2\times7}=4\sqrt{7}$

27) $8\sqrt{3}$
⇨ $\sqrt{192}=\sqrt{8^2\times3}=8\sqrt{3}$

28) $3\sqrt{6}$

29) $7\sqrt{3}$

30) $-6\sqrt{7}$

31) $3\sqrt{13}$

32) $-7\sqrt{7}$

33) $-\frac{\sqrt{5}}{10}$
⇨ $-\sqrt{0.05}=-\sqrt{\frac{5}{100}}=-\sqrt{\frac{5}{10^2}}=-\frac{\sqrt{5}}{10}$

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

57) $\sqrt{44}$

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

58) $\sqrt{45}$

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

59) $\sqrt{50}$

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

60) $-\sqrt{63}$

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

61) $\sqrt{84}$

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

62) $\sqrt{96}$

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

63) $-\sqrt{98}$

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

64) $\sqrt{108}$

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

65) $\sqrt{135}$

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

66) $\sqrt{175}$

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

67) $\sqrt{288}$

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

68) $\sqrt{300}$

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

69) $\sqrt{18}$

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

70) $\sqrt{24}$

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

71) $-\sqrt{63}$

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

72) $-\sqrt{360}$

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

73) $\sqrt{176}$

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

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

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

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

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

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

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

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

78) $\sqrt{3}$

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

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

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

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

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

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

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

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

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

83) $\sqrt{5}$

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

84) $-\sqrt{3}$

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

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

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

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

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

87) $\sqrt{2}$

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

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

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

89) $-\sqrt{2}$

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

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

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

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

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

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

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

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

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