



계산력 연습

중 3 과정

[영역] 1.수와 연산

1-3-2.분모가 한 개의 항으로 되어 있는 무리수의 분모를 유리화하기



◇ 「콘텐츠산업 진흥법 시행령」 제33조에 의한 표시

1) 제작연월일 : 2016-01-13

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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. 분모의 유리화

(1) 분모의 유리화: 분모가 근호를 포함한 무리수일 때, 분모, 분자에 0이 아닌 같은 수를 곱하여 분모의 근호를 없애고 분모를 유리수로 고치는 것

$a > 0, b > 0$ 일 때,

$$\textcircled{1} \frac{b}{\sqrt{a}} = \frac{b \times \sqrt{a}}{\sqrt{a} \times \sqrt{a}} = \frac{b\sqrt{a}}{a}$$

$$\textcircled{2} \frac{\sqrt{b}}{\sqrt{a}} = \frac{\sqrt{b} \times \sqrt{a}}{\sqrt{a} \times \sqrt{a}} = \frac{\sqrt{ab}}{a}$$

$$\textcircled{3} \frac{c}{b\sqrt{a}} = \frac{c \times \sqrt{a}}{b\sqrt{a} \times \sqrt{a}} = \frac{c\sqrt{a}}{ab}$$



$\frac{b}{\sqrt{a}}$ 꼴의 유리화

▣ 다음 수의 분모를 유리화하여라.

1. $\frac{1}{\sqrt{2}}$

2. $\frac{1}{\sqrt{3}}$

3. $\frac{1}{\sqrt{5}}$

4. $\frac{1}{\sqrt{7}}$

5. $\frac{1}{\sqrt{10}}$

6. $\frac{1}{\sqrt{11}}$

7. $\frac{1}{\sqrt{15}}$

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

9. $-\frac{2}{\sqrt{3}}$

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

11. $\frac{1}{\sqrt{12}}$

12. $\frac{4}{\sqrt{20}}$

13. $-\frac{4}{\sqrt{7}}$

14. $\frac{9}{\sqrt{3}}$

15. $\frac{5}{\sqrt{10}}$

16. $-\frac{6}{\sqrt{3}}$

17. $\frac{5}{\sqrt{15}}$

18. $\frac{2}{\sqrt{11}}$

19. $-\frac{7}{\sqrt{7}}$

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

21. $\frac{3}{\sqrt{20}}$

22. $-\frac{5}{\sqrt{48}}$

23. $-\frac{4}{\sqrt{72}}$

24. $\frac{5}{\sqrt{7}}$

25. $\frac{3}{\sqrt{10}}$

26. $\frac{7}{\sqrt{13}}$

27. $\frac{11}{\sqrt{15}}$

28. $\frac{5}{\sqrt{30}}$

29. $\frac{6}{\sqrt{12}}$

30. $\frac{7}{\sqrt{21}}$

31. $-\frac{12}{\sqrt{6}}$

32. $\frac{4}{\sqrt{10}}$

33. $-\frac{8}{\sqrt{14}}$

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

35. $\frac{8}{\sqrt{96}}$

36. $\frac{25}{\sqrt{200}}$

37. $\frac{30}{\sqrt{500}}$


 $\frac{\sqrt{b}}{\sqrt{a}}$ 꼴의 유리화

▣ 다음 수의 분모를 유리화하여라.

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

39. $\frac{\sqrt{7}}{\sqrt{48}}$

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

41. $\frac{\sqrt{10}}{\sqrt{3}}$

42. $\frac{\sqrt{2}}{\sqrt{7}}$

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

44. $\frac{\sqrt{5}}{\sqrt{7}}$

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

46. $\frac{\sqrt{5}}{\sqrt{6}}$

47. $\frac{\sqrt{3}}{\sqrt{7}}$

48. $\frac{\sqrt{5}}{\sqrt{8}}$

49. $\frac{\sqrt{11}}{\sqrt{10}}$

50. $\frac{\sqrt{7}}{\sqrt{11}}$

51. $\frac{\sqrt{3}}{\sqrt{13}}$

52. $\frac{\sqrt{7}}{\sqrt{15}}$

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

54. $\frac{\sqrt{10}}{\sqrt{11}}$

55. $\frac{\sqrt{13}}{\sqrt{5}}$

56. $\frac{\sqrt{5}}{\sqrt{14}}$

57. $\frac{\sqrt{6}}{\sqrt{21}}$

58. $-\frac{\sqrt{6}}{\sqrt{15}}$

59. $\frac{\sqrt{14}}{\sqrt{6}}$

60. $\frac{6\sqrt{2}}{\sqrt{10}}$

61. $\frac{3\sqrt{6}}{\sqrt{18}}$

62. $\frac{2\sqrt{5}}{\sqrt{14}}$

63. $-\frac{6\sqrt{2}}{\sqrt{3}}$

64. $-\frac{3\sqrt{2}}{\sqrt{6}}$

65. $-\frac{2\sqrt{7}}{\sqrt{18}}$

66. $\frac{6\sqrt{5}}{\sqrt{24}}$

67. $\frac{\sqrt{18}}{\sqrt{96}}$

68. $\frac{4\sqrt{7}}{\sqrt{14}}$

69. $-\frac{5\sqrt{3}}{\sqrt{20}}$

70. $\frac{2\sqrt{12}}{\sqrt{30}}$

71. $\frac{3\sqrt{15}}{\sqrt{50}}$

72. $\frac{4\sqrt{11}}{\sqrt{8}}$

73. $\frac{5\sqrt{13}}{\sqrt{65}}$

 $\frac{c}{b\sqrt{a}}$ 꼴의 유리화

▣ 다음 수의 분모를 유리화하여라.

74. $\frac{3}{4\sqrt{2}}$

75. $\frac{\sqrt{2}}{3\sqrt{6}}$

76. $-\frac{\sqrt{3}}{2\sqrt{2}}$

77. $\frac{\sqrt{10}}{3\sqrt{3}}$

78. $\frac{3\sqrt{2}}{4\sqrt{3}}$

79. $\frac{5\sqrt{3}}{2\sqrt{5}}$

80. $\frac{3}{7\sqrt{2}}$

81. $\frac{6}{5\sqrt{3}}$

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

83. $\frac{3}{2\sqrt{6}}$

84. $\frac{15}{2\sqrt{5}}$

85. $\frac{2}{3\sqrt{5}}$

86. $\frac{6}{5\sqrt{7}}$

87. $\frac{5}{2\sqrt{11}}$

88. $\frac{\sqrt{2}}{5\sqrt{3}}$

89. $\frac{\sqrt{3}}{6\sqrt{5}}$

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

91. $\frac{6}{5\sqrt{3}}$

92. $\frac{11}{9\sqrt{2}}$

93. $\frac{\sqrt{5}}{\sqrt{3}\sqrt{7}}$

94. $\frac{\sqrt{5}}{\sqrt{2}\sqrt{11}}$

95. $\frac{\sqrt{2}}{\sqrt{3}\sqrt{5}}$

96. $\frac{\sqrt{3}}{\sqrt{2}\sqrt{7}}$

97. $\frac{\sqrt{15}}{\sqrt{6}\sqrt{10}}$

98. $\frac{\sqrt{18}}{4\sqrt{15}}$

99. $\frac{7\sqrt{3}}{\sqrt{2}\sqrt{98}}$

100. $\frac{3\sqrt{2}}{\sqrt{5}\sqrt{15}}$

정답 및 해설



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

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

$$\Rightarrow \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{3}}{3}$$

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

$$\Rightarrow \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{5}$$

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

$$\Rightarrow \frac{1}{\sqrt{7}} = \frac{\sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{7}}{7}$$

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

$$\Rightarrow \frac{1}{\sqrt{10}} = \frac{\sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{\sqrt{10}}{10}$$

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

$$\Rightarrow \frac{1}{\sqrt{11}} = \frac{\sqrt{11}}{\sqrt{11} \times \sqrt{11}} = \frac{\sqrt{11}}{11}$$

7) $\frac{\sqrt{15}}{15}$

$$\Rightarrow \frac{1}{\sqrt{15}} = \frac{\sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{\sqrt{15}}{15}$$

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

$$\Rightarrow \frac{2}{\sqrt{3}} = \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{2\sqrt{3}}{3}$$

9) $-\frac{2\sqrt{3}}{3}$

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

$$\Rightarrow \frac{3}{\sqrt{5}} = \frac{3 \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{3\sqrt{5}}{5}$$

11) $\frac{\sqrt{3}}{6}$

$$\Rightarrow \frac{1}{\sqrt{12}} = \frac{1 \times \sqrt{3}}{2\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{3}}{6}$$

12) $\frac{2\sqrt{5}}{5}$

$$\Rightarrow \frac{4}{\sqrt{20}} = \frac{4 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{4\sqrt{5}}{10} = \frac{2\sqrt{5}}{5}$$

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

$$\Rightarrow -\frac{4}{\sqrt{7}} = -\frac{4 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = -\frac{4\sqrt{7}}{7}$$

14) $3\sqrt{3}$

$$\Rightarrow \frac{9}{\sqrt{3}} = \frac{9 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{9\sqrt{3}}{3} = 3\sqrt{3}$$

15) $\frac{\sqrt{10}}{2}$

$$\Rightarrow \frac{5}{\sqrt{10}} = \frac{5 \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{5\sqrt{10}}{10} = \frac{\sqrt{10}}{2}$$

16) $-2\sqrt{3}$

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

17) $\frac{\sqrt{15}}{3}$

$$\Rightarrow \frac{5}{\sqrt{15}} = \frac{5 \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{5\sqrt{15}}{15} = \frac{\sqrt{15}}{3}$$

18) $\frac{2\sqrt{11}}{11}$

$$\Rightarrow \frac{2}{\sqrt{11}} = \frac{2 \times \sqrt{11}}{\sqrt{11} \times \sqrt{11}} = \frac{2\sqrt{11}}{11}$$

19) $-\sqrt{7}$

$$\Rightarrow -\frac{7}{\sqrt{7}} = -\frac{7 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = -\frac{7\sqrt{7}}{7} = -\sqrt{7}$$

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

$$\Rightarrow \frac{2}{\sqrt{12}} = \frac{2}{2\sqrt{3}} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{3}}{3}$$

21) $\frac{3\sqrt{5}}{10}$

$$\Rightarrow \frac{3}{\sqrt{20}} = \frac{3}{2\sqrt{5}} = \frac{3 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{3\sqrt{5}}{10}$$

22) $-\frac{5\sqrt{3}}{12}$

$$\Rightarrow -\frac{5}{\sqrt{48}} = -\frac{5}{4\sqrt{3}} = -\frac{5 \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} = -\frac{5\sqrt{3}}{12}$$

$$23) -\frac{\sqrt{2}}{3}$$

$$\Rightarrow -\frac{4}{\sqrt{72}} = -\frac{4}{6\sqrt{2}} = -\frac{2}{3\sqrt{2}} = -\frac{2 \times \sqrt{2}}{3\sqrt{2} \times \sqrt{2}} = -\frac{2\sqrt{2}}{6} = -\frac{\sqrt{2}}{3}$$

$$24) \frac{5\sqrt{7}}{7}$$

$$\Rightarrow \frac{5}{\sqrt{7}} = \frac{5 \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{5\sqrt{7}}{7}$$

$$25) \frac{3\sqrt{10}}{10}$$

$$\Rightarrow \frac{3}{\sqrt{10}} = \frac{3 \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{3\sqrt{10}}{10}$$

$$26) \frac{7\sqrt{13}}{13}$$

$$\Rightarrow \frac{7}{\sqrt{13}} = \frac{7 \times \sqrt{13}}{\sqrt{13} \times \sqrt{13}} = \frac{7\sqrt{13}}{13}$$

$$27) \frac{11\sqrt{15}}{15}$$

$$\Rightarrow \frac{11}{\sqrt{15}} = \frac{11 \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{11\sqrt{15}}{15}$$

$$28) \frac{\sqrt{30}}{6}$$

$$\Rightarrow \frac{5}{\sqrt{30}} = \frac{5\sqrt{30}}{30} = \frac{\sqrt{30}}{6}$$

$$29) \sqrt{3}$$

$$\Rightarrow \frac{6}{\sqrt{12}} = \frac{6}{2\sqrt{3}} = \frac{3}{\sqrt{3}} = \frac{3\sqrt{3}}{3} = \sqrt{3}$$

$$30) \frac{\sqrt{21}}{3}$$

$$31) -2\sqrt{6}$$

$$32) \frac{2\sqrt{10}}{5}$$

$$33) -\frac{4\sqrt{14}}{7}$$

$$34) \frac{4\sqrt{3}}{3}$$

$$\Rightarrow \frac{16}{\sqrt{48}} = \frac{16}{\sqrt{4^2 \times 3}} = \frac{16}{4\sqrt{3}} = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$$

$$35) \frac{\sqrt{6}}{3}$$

$$\Rightarrow \frac{8}{\sqrt{96}} = \frac{8}{\sqrt{4^2 \times 6}} = \frac{8}{4\sqrt{6}} = \frac{2}{\sqrt{6}} = \frac{2\sqrt{6}}{6} = \frac{\sqrt{6}}{3}$$

$$36) \frac{5\sqrt{2}}{4}$$

$$\Rightarrow \frac{25}{\sqrt{200}} = \frac{25}{\sqrt{10^2 \times 2}} = \frac{25}{10\sqrt{2}} = \frac{25\sqrt{2}}{10 \times 2} = \frac{5\sqrt{2}}{4}$$

$$37) \frac{3\sqrt{5}}{5}$$

$$\Rightarrow \frac{30}{\sqrt{500}} = \frac{30}{\sqrt{10^2 \times 5}} = \frac{30}{10\sqrt{5}} = \frac{3\sqrt{5}}{5}$$

$$38) \frac{\sqrt{15}}{5}$$

$$\Rightarrow \frac{\sqrt{3}}{\sqrt{5}} = \frac{\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{15}}{5}$$

$$39) \frac{\sqrt{21}}{12}$$

$$\Rightarrow \frac{\sqrt{7}}{\sqrt{48}} = \frac{\sqrt{7}}{4\sqrt{3}} = \frac{\sqrt{7} \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{21}}{12}$$

$$40) \frac{\sqrt{10}}{5}$$

$$\Rightarrow \frac{\sqrt{2}}{\sqrt{5}} = \frac{\sqrt{2} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{10}}{5}$$

$$41) \frac{\sqrt{30}}{3}$$

$$\Rightarrow \frac{\sqrt{10}}{\sqrt{3}} = \frac{\sqrt{10} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{30}}{3}$$

$$42) \frac{\sqrt{14}}{7}$$

$$\Rightarrow \frac{\sqrt{2}}{\sqrt{7}} = \frac{\sqrt{2} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{14}}{7}$$

$$43) \frac{\sqrt{42}}{6}$$

$$\Rightarrow \frac{\sqrt{7}}{\sqrt{6}} = \frac{\sqrt{7} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{42}}{6}$$

$$44) \frac{\sqrt{35}}{7}$$

$$\Rightarrow \frac{\sqrt{5}}{\sqrt{7}} = \frac{\sqrt{5} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{35}}{7}$$

$$45) \frac{\sqrt{6}}{3}$$

$$\Rightarrow \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{2} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{6}}{3}$$

$$46) \frac{\sqrt{30}}{6}$$

$$\Rightarrow \frac{\sqrt{5}}{\sqrt{6}} = \frac{\sqrt{5} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{30}}{6}$$

$$47) \frac{\sqrt{21}}{7}$$

$$\Rightarrow \frac{\sqrt{3}}{\sqrt{7}} = \frac{\sqrt{3} \times \sqrt{7}}{\sqrt{7} \times \sqrt{7}} = \frac{\sqrt{21}}{7}$$

$$48) \frac{\sqrt{10}}{4}$$

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

$$49) \frac{\sqrt{110}}{10}$$

$$\Rightarrow \frac{\sqrt{11}}{\sqrt{10}} = \frac{\sqrt{11} \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{\sqrt{110}}{10}$$

$$50) \frac{\sqrt{77}}{11}$$

$$\Rightarrow \frac{\sqrt{7}}{\sqrt{11}} = \frac{\sqrt{7} \times \sqrt{11}}{\sqrt{11} \times \sqrt{11}} = \frac{\sqrt{77}}{11}$$

$$51) \frac{\sqrt{39}}{13}$$

$$\Rightarrow \frac{\sqrt{3}}{\sqrt{13}} = \frac{\sqrt{3} \times \sqrt{13}}{\sqrt{13} \times \sqrt{13}} = \frac{\sqrt{39}}{13}$$

$$52) \frac{\sqrt{105}}{15}$$

$$\Rightarrow \frac{\sqrt{7}}{\sqrt{15}} = \frac{\sqrt{7} \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{\sqrt{105}}{15}$$

$$53) \frac{\sqrt{3}}{2}$$

$$\Rightarrow \frac{3}{2\sqrt{3}} = \frac{3 \times \sqrt{3}}{2\sqrt{3} \times \sqrt{3}} = \frac{3\sqrt{3}}{2 \times 3} = \frac{\sqrt{3}}{2}$$

$$54) \frac{\sqrt{110}}{11}$$

$$\Rightarrow \frac{\sqrt{10}}{\sqrt{11}} = \frac{\sqrt{10} \times \sqrt{11}}{\sqrt{11} \times \sqrt{11}} = \frac{\sqrt{110}}{11}$$

$$55) \frac{\sqrt{65}}{5}$$

$$56) \frac{\sqrt{70}}{14}$$

$$57) \frac{\sqrt{14}}{7}$$

$$\Rightarrow \frac{\sqrt{6}}{\sqrt{21}} = \frac{\sqrt{6} \times \sqrt{21}}{21} = \frac{\sqrt{3^2 \times 14}}{21} = \frac{3\sqrt{14}}{21} = \frac{\sqrt{14}}{7}$$

$$58) -\frac{\sqrt{10}}{5}$$

$$\begin{aligned} \Rightarrow -\frac{\sqrt{6}}{\sqrt{15}} &= -\frac{\sqrt{6} \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = -\frac{\sqrt{90}}{15} \\ &= -\frac{3\sqrt{10}}{15} = -\frac{\sqrt{10}}{5} \end{aligned}$$

$$59) \frac{\sqrt{21}}{3}$$

$$\Rightarrow \frac{\sqrt{14}}{\sqrt{6}} = \frac{\sqrt{14} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{84}}{6} = \frac{2\sqrt{21}}{6} = \frac{\sqrt{21}}{3}$$

$$60) \frac{6\sqrt{5}}{5}$$

$$\begin{aligned} \Rightarrow \frac{6\sqrt{2}}{\sqrt{10}} &= \frac{6\sqrt{2} \times \sqrt{10}}{\sqrt{10} \times \sqrt{10}} = \frac{6\sqrt{20}}{10} \\ &= \frac{12\sqrt{5}}{10} = \frac{6\sqrt{5}}{5} \end{aligned}$$

$$61) \sqrt{3}$$

$$\Rightarrow \frac{3\sqrt{6}}{\sqrt{18}} = \frac{3\sqrt{6} \times \sqrt{2}}{3\sqrt{2} \times \sqrt{2}} = \frac{6\sqrt{3}}{6} = \sqrt{3}$$

$$62) \frac{\sqrt{70}}{7}$$

$$\Rightarrow \frac{2\sqrt{5}}{\sqrt{14}} = \frac{2\sqrt{5} \times \sqrt{14}}{\sqrt{14} \times \sqrt{14}} = \frac{2\sqrt{70}}{14} = \frac{\sqrt{70}}{7}$$

$$63) -2\sqrt{6}$$

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

$$64) -\sqrt{3}$$

$$\begin{aligned} \Rightarrow -\frac{3\sqrt{2}}{\sqrt{6}} &= -\frac{3\sqrt{2} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = -\frac{3\sqrt{12}}{6} \\ &= -\frac{6\sqrt{3}}{6} = -\sqrt{3} \end{aligned}$$

$$65) -\frac{\sqrt{14}}{3}$$

$$\begin{aligned} \Rightarrow -\frac{2\sqrt{7}}{\sqrt{18}} &= -\frac{2\sqrt{7}}{3\sqrt{2}} = -\frac{2\sqrt{7} \times \sqrt{2}}{3\sqrt{2} \times \sqrt{2}} \\ &= -\frac{2\sqrt{14}}{6} = -\frac{\sqrt{14}}{3} \end{aligned}$$

$$66) \frac{\sqrt{30}}{2}$$

$$\Rightarrow \frac{6\sqrt{5}}{\sqrt{24}} = \frac{6\sqrt{5}}{2\sqrt{6}} = \frac{3\sqrt{5}}{\sqrt{6}} = \frac{3\sqrt{5} \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{3\sqrt{30}}{6} = \frac{\sqrt{30}}{2}$$

$$67) \frac{\sqrt{3}}{4}$$

$$\Rightarrow \frac{\sqrt{18}}{\sqrt{96}} = \frac{3\sqrt{2}}{4\sqrt{6}} = \frac{3\sqrt{2} \times \sqrt{6}}{4 \times 6} = \frac{6\sqrt{3}}{24} = \frac{\sqrt{3}}{4}$$

$$68) 2\sqrt{2}$$

$$69) -\frac{\sqrt{15}}{2}$$

$$\Rightarrow -\frac{5\sqrt{3}}{\sqrt{20}} = -\frac{5\sqrt{3} \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = -\frac{5\sqrt{15}}{10} = -\frac{\sqrt{15}}{2}$$

$$70) \frac{2\sqrt{10}}{5}$$

$$71) \frac{3\sqrt{30}}{10}$$

$$72) \sqrt{22}$$

$$73) \sqrt{5}$$

$$74) \frac{3\sqrt{2}}{8}$$

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

$$75) \frac{\sqrt{3}}{9}$$

$$76) -\frac{\sqrt{6}}{4}$$

$$\Rightarrow -\frac{\sqrt{3}}{2\sqrt{2}} = -\frac{\sqrt{3} \times \sqrt{2}}{2\sqrt{2} \times \sqrt{2}} = -\frac{\sqrt{6}}{4}$$

$$77) \frac{\sqrt{30}}{9}$$

$$\Rightarrow \frac{\sqrt{10}}{3\sqrt{3}} = \frac{\sqrt{10} \times \sqrt{3}}{3\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{30}}{9}$$

$$78) \frac{\sqrt{6}}{4}$$

$$\Rightarrow \frac{3\sqrt{2}}{4\sqrt{3}} = \frac{3\sqrt{2} \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} = \frac{3\sqrt{6}}{12} = \frac{\sqrt{6}}{4}$$

$$79) \frac{\sqrt{15}}{2}$$

$$\Rightarrow \frac{5\sqrt{3}}{2\sqrt{5}} = \frac{5\sqrt{3} \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{5\sqrt{15}}{10} = \frac{\sqrt{15}}{2}$$

$$80) \frac{3\sqrt{2}}{14}$$

$$\Rightarrow \frac{3}{7\sqrt{2}} = \frac{3 \times \sqrt{2}}{7\sqrt{2} \times \sqrt{2}} = \frac{3\sqrt{2}}{14}$$

$$81) \frac{2\sqrt{3}}{5}$$

$$\Rightarrow \frac{6}{5\sqrt{3}} = \frac{6 \times \sqrt{3}}{5\sqrt{3} \times \sqrt{3}} = \frac{6\sqrt{3}}{15} = \frac{2\sqrt{3}}{5}$$

$$82) \frac{2\sqrt{3}}{9}$$

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

$$83) \frac{\sqrt{6}}{4}$$

$$\Rightarrow \frac{3}{2\sqrt{6}} = \frac{3 \times \sqrt{6}}{2\sqrt{6} \times \sqrt{6}} = \frac{3\sqrt{6}}{12} = \frac{\sqrt{6}}{4}$$

$$84) \frac{3\sqrt{5}}{2}$$

$$\Rightarrow \frac{15}{2\sqrt{5}} = \frac{15 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{15\sqrt{5}}{10} = \frac{3\sqrt{5}}{2}$$

$$85) \frac{2\sqrt{5}}{15}$$

$$\Rightarrow \frac{2}{3\sqrt{5}} = \frac{2 \times \sqrt{5}}{3\sqrt{5} \times \sqrt{5}} = \frac{2\sqrt{5}}{3 \times 5} = \frac{2\sqrt{5}}{15}$$

$$86) \frac{6\sqrt{7}}{35}$$

$$\Rightarrow \frac{6}{5\sqrt{7}} = \frac{6 \times \sqrt{7}}{5\sqrt{7} \times \sqrt{7}} = \frac{6\sqrt{7}}{5 \times 7} = \frac{6\sqrt{7}}{35}$$

$$87) \frac{5\sqrt{11}}{22}$$

$$\Rightarrow \frac{5}{2\sqrt{11}} = \frac{5 \times \sqrt{11}}{2\sqrt{11} \times \sqrt{11}} = \frac{5\sqrt{11}}{2 \times 11} = \frac{5\sqrt{11}}{22}$$

$$88) \frac{\sqrt{6}}{15}$$

$$\Rightarrow \frac{\sqrt{2}}{5\sqrt{3}} = \frac{\sqrt{2} \times \sqrt{3}}{5\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{2 \times 3}}{5 \times 3} = \frac{\sqrt{6}}{15}$$

$$89) \frac{\sqrt{15}}{30}$$

$$\Rightarrow \frac{\sqrt{3}}{6\sqrt{5}} = \frac{\sqrt{3} \times \sqrt{5}}{6\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{3 \times 5}}{6 \times 5} = \frac{\sqrt{15}}{30}$$

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

$$\Rightarrow \frac{3}{4\sqrt{3}} = \frac{3 \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} = \frac{3\sqrt{3}}{12} = \frac{\sqrt{3}}{4}$$

$$91) \frac{2\sqrt{3}}{5}$$

$$\Rightarrow \frac{6}{5\sqrt{3}} = \frac{6 \times \sqrt{3}}{5\sqrt{3} \times \sqrt{3}} = \frac{2\sqrt{3}}{5}$$

$$92) \frac{11\sqrt{2}}{18}$$

$$\Rightarrow \frac{11}{9\sqrt{2}} = \frac{11 \times \sqrt{2}}{9\sqrt{2} \times \sqrt{2}} = \frac{11\sqrt{2}}{18}$$

$$93) \frac{\sqrt{105}}{21}$$

$$\Rightarrow \frac{\sqrt{5}}{\sqrt{3}\sqrt{7}} = \frac{\sqrt{5} \times \sqrt{3} \times \sqrt{7}}{\sqrt{3} \times \sqrt{3} \times \sqrt{7} \times \sqrt{7}} = \frac{\sqrt{105}}{21}$$

$$94) \frac{\sqrt{110}}{22}$$

$$\Rightarrow \frac{\sqrt{5}}{\sqrt{2}\sqrt{11}} = \frac{\sqrt{5} \times \sqrt{2} \times \sqrt{11}}{\sqrt{2} \times \sqrt{2} \times \sqrt{11} \times \sqrt{11}} = \frac{\sqrt{110}}{22}$$

$$95) \frac{\sqrt{30}}{15}$$

$$\Rightarrow \frac{\sqrt{2}}{\sqrt{3}\sqrt{5}} = \frac{\sqrt{2}}{\sqrt{15}} = \frac{\sqrt{2} \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{\sqrt{30}}{15}$$

$$96) \frac{\sqrt{42}}{14}$$

$$\Rightarrow \frac{\sqrt{3}}{\sqrt{2}\sqrt{7}} = \frac{\sqrt{3}}{\sqrt{14}} = \frac{\sqrt{3} \times \sqrt{14}}{\sqrt{14} \times \sqrt{14}} = \frac{\sqrt{42}}{14}$$

$$97) \frac{1}{2}$$

$$98) \frac{\sqrt{30}}{20}$$

$$\Rightarrow \frac{\sqrt{18}}{4\sqrt{15}} = \frac{\sqrt{18} \times \sqrt{15}}{4 \times 15} = \frac{3\sqrt{30}}{60} = \frac{\sqrt{30}}{20}$$

$$99) \frac{\sqrt{3}}{2}$$

$$100) \frac{\sqrt{6}}{5}$$

$$\Rightarrow \frac{3\sqrt{2}}{\sqrt{5}\sqrt{15}} = \frac{3\sqrt{2}}{5\sqrt{3}} = \frac{3\sqrt{2} \times \sqrt{3}}{15} = \frac{\sqrt{6}}{5}$$