



◇ 「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. 근호를 포함한 식의 분배법칙

(1)  $a > 0, b > 0, c > 0$  일 때

①  $\sqrt{a}(\sqrt{b} + \sqrt{c}) = \sqrt{ab} + \sqrt{ac}, \sqrt{a}(\sqrt{b} - \sqrt{c}) = \sqrt{ab} - \sqrt{ac}$

②  $(\sqrt{a} + \sqrt{b})\sqrt{c} = \sqrt{ac} + \sqrt{bc}, (\sqrt{a} - \sqrt{b})\sqrt{c} = \sqrt{ac} - \sqrt{bc}$

## 2. 분배법칙을 이용한 분모의 유리화

(1)  $a > 0, b > 0, c > 0$  일 때,  $\frac{\sqrt{a} + \sqrt{b}}{\sqrt{c}} = \frac{(\sqrt{a} + \sqrt{b}) \times \sqrt{c}}{\sqrt{c} \times \sqrt{c}} = \frac{\sqrt{ac} + \sqrt{bc}}{c}$

## 3. 근호를 포함한 복잡한 식의 계산

(1) 괄호가 있으면 분배법칙을 이용하여 괄호를 푼다.

(2) 근호 안에 제곱인 인수가 있으면 근호 밖으로 꺼내어 간단히 한다.

(3) 분모에 무리수가 있으면 분모를 유리화한다.

(4) 곱셈, 나눗셈을 먼저 계산한다.

(5) 근호 안의 수가 같은 것끼리 모아서 덧셈, 뺄셈을 한다.



## 분배법칙을 이용한 식의 계산

▣ 다음 식을 간단히 하여라.

1.  $\sqrt{2}(3 + \sqrt{3})$

2.  $(\sqrt{18} - \sqrt{12}) \div \sqrt{3}$

3.  $\sqrt{5}(2\sqrt{5} - \sqrt{8})$

4.  $\sqrt{2}(\sqrt{3} + \sqrt{7})$

5.  $\sqrt{3}(2\sqrt{2} - 1)$

6.  $\sqrt{5}(\sqrt{3} + \sqrt{15})$

7.  $\sqrt{2}(\sqrt{6} - \sqrt{2})$

8.  $(\sqrt{3} + \sqrt{2})\sqrt{7}$

9.  $(\sqrt{3} - \sqrt{10})\sqrt{2}$

10.  $(3\sqrt{2} - \sqrt{6})\sqrt{3}$

11.  $\sqrt{5}(\sqrt{10} + \sqrt{20})$

12.  $(2\sqrt{3} - \sqrt{2}) \div \sqrt{2}$

13.  $(4\sqrt{3}-3) \div \sqrt{3}$

14.  $(\sqrt{40}-\sqrt{24}) \div \sqrt{8}$

15.  $(\sqrt{45}-\sqrt{10}) \div \sqrt{5}$

16.  $(2\sqrt{15}-\sqrt{18}) \div \sqrt{3}$

17.  $(\sqrt{48}-\sqrt{15}) \div (-\sqrt{3})$

18.  $(4-2\sqrt{3}) \div \sqrt{2}$

19.  $(\sqrt{80}-\sqrt{60}) \div \sqrt{5}$

20.  $\sqrt{2}(\sqrt{3}-\sqrt{5})$

21.  $\sqrt{3}(\sqrt{5}+\sqrt{7})$

22.  $-\sqrt{2}(\sqrt{2}+\sqrt{6})$

23.  $\sqrt{5}(\sqrt{3}-\sqrt{7})$

24.  $-2\sqrt{2}(\sqrt{3}+\sqrt{11})$

25.  $\sqrt{7}(2\sqrt{3}+\sqrt{7})$

26.  $(\sqrt{7}+\sqrt{3})\sqrt{5}$

27.  $(\sqrt{11}+2\sqrt{3})\sqrt{2}$

28.  $(\sqrt{5}-2\sqrt{2})\sqrt{3}$

29.  $(3\sqrt{2}+4\sqrt{3})\sqrt{7}$

30.  $(4\sqrt{5}-\sqrt{7})\sqrt{5}$

31.  $(\sqrt{2}-3\sqrt{3})\sqrt{3}$

32.  $3\sqrt{6}(2\sqrt{2}-5\sqrt{3})$

33.  $(-3\sqrt{3}-5\sqrt{2})\sqrt{6}$

34.  $(5\sqrt{42}+6\sqrt{14}) \div \sqrt{7}$

35.  $(-3\sqrt{3}+5\sqrt{2}) \div \sqrt{6}$

36.  $2\sqrt{3}(\sqrt{8}+3\sqrt{5})$

37.  $-\sqrt{5}(4\sqrt{2}-\sqrt{54})$

38.  $(\sqrt{6}-2\sqrt{2})\sqrt{3}$

39.  $(\sqrt{75}+\sqrt{32})\sqrt{5}$

40.  $2\sqrt{6}(\sqrt{5}+\sqrt{8})$

41.  $-3\sqrt{2}(\sqrt{12}+3\sqrt{2})$

42.  $\sqrt{6}(3\sqrt{10}-2\sqrt{15})$



## 분모의 유리화

▣ 다음 분수를 유리화 하여라.

$$56. \frac{\sqrt{5}-\sqrt{3}}{\sqrt{3}}$$

$$57. \frac{\sqrt{6}+\sqrt{8}}{\sqrt{2}}$$

$$58. \frac{\sqrt{2}-\sqrt{5}}{\sqrt{10}}$$

$$59. \frac{\sqrt{3}-2\sqrt{12}}{\sqrt{15}}$$

$$60. \frac{\sqrt{8}+6\sqrt{6}}{3\sqrt{2}}$$

$$61. \frac{\sqrt{3}+\sqrt{6}}{\sqrt{2}}$$

$$62. \frac{4\sqrt{3}-3}{\sqrt{3}}$$

$$63. \frac{10+\sqrt{10}}{\sqrt{2}}$$

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

$$43. 3\sqrt{3}(2\sqrt{6}+\sqrt{27})$$

$$44. (2\sqrt{5}+\sqrt{32})\sqrt{5}$$

$$45. (-3\sqrt{6}+4\sqrt{3})\sqrt{2}$$

$$46. (7\sqrt{3}-4\sqrt{5})\sqrt{15}$$

$$47. (5\sqrt{6}+\sqrt{12})\sqrt{3}$$

$$48. (\sqrt{6}+\sqrt{12})\div\sqrt{3}$$

$$49. (\sqrt{12}+\sqrt{18})\div\sqrt{6}$$

$$50. (\sqrt{8}-\sqrt{3})\div\sqrt{2}$$

$$51. (2\sqrt{15}+\sqrt{3})\div\sqrt{5}$$

$$52. (3\sqrt{21}-4\sqrt{14})\div\sqrt{7}$$

$$53. (\sqrt{6}-4\sqrt{2})\div\sqrt{6}$$

$$54. (6\sqrt{2}-2\sqrt{6})\div\sqrt{3}$$

$$55. (3\sqrt{3}-5\sqrt{2})\div\sqrt{10}$$

65.  $\frac{\sqrt{35} + \sqrt{15}}{\sqrt{5}}$

75.  $\frac{4 + 2\sqrt{2}}{3\sqrt{8}}$

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

76.  $\frac{6\sqrt{2} - \sqrt{24}}{\sqrt{12}}$

67.  $\frac{\sqrt{72} - 18}{\sqrt{3}}$

77.  $\frac{6 + 3\sqrt{5}}{\sqrt{3}}$

68.  $\frac{\sqrt{6} - \sqrt{8}}{2\sqrt{2}}$

78.  $\frac{2\sqrt{7} - 3\sqrt{3}}{\sqrt{6}}$

69.  $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{12}}$

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

70.  $\frac{\sqrt{12} - \sqrt{15}}{\sqrt{3}}$

80.  $\frac{\sqrt{3} + \sqrt{7}}{\sqrt{5}}$

71.  $\frac{\sqrt{54} + \sqrt{15}}{\sqrt{6}}$

81.  $\frac{\sqrt{5} + 2}{\sqrt{6}}$

72.  $\frac{2\sqrt{3} - \sqrt{6}}{\sqrt{48}}$

82.  $\frac{\sqrt{2} - \sqrt{5}}{\sqrt{3}}$

73.  $\frac{4\sqrt{3} - \sqrt{6}}{\sqrt{3}}$

83.  $\frac{\sqrt{6} - \sqrt{3}}{\sqrt{5}}$

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



## 분배법칙을 이용한 복잡한 식의 계산

■ 다음 식을 간단히 하여라.

$$84. \frac{4 - \sqrt{5}}{\sqrt{2}}$$

$$85. \frac{2\sqrt{2} + \sqrt{6}}{\sqrt{5}}$$

$$86. \frac{2\sqrt{5} + 4\sqrt{6}}{\sqrt{3}}$$

$$87. \frac{2\sqrt{6} + 3\sqrt{3}}{\sqrt{8}}$$

$$88. \frac{3\sqrt{2} + 5\sqrt{7}}{\sqrt{14}}$$

$$89. \frac{4\sqrt{3} - \sqrt{18}}{\sqrt{6}}$$

$$90. \frac{5\sqrt{2} - 2\sqrt{10}}{\sqrt{5}}$$

$$91. \frac{5\sqrt{3} - 2\sqrt{6}}{\sqrt{12}}$$

$$92. \frac{2\sqrt{15} - 3\sqrt{3}}{\sqrt{10}}$$

$$93. \frac{\sqrt{20} - \sqrt{15}}{\sqrt{5}} + \sqrt{3}$$

$$94. \frac{4\sqrt{3} - 3}{\sqrt{3}} + \sqrt{12}$$

$$95. \frac{\sqrt{12} - \sqrt{6}}{\sqrt{3}} + 2\sqrt{2} - 1$$

$$96. 4\sqrt{3}(\sqrt{3} - 1) + 5(2 - \sqrt{3})$$

$$97. 8\sqrt{7} + (6\sqrt{14} - 9\sqrt{2}) \div 3\sqrt{2}$$

$$98. \frac{45}{\sqrt{5}} - \sqrt{3}(2\sqrt{15} - \sqrt{12}) + 2\sqrt{5}$$

$$99. (2\sqrt{30} - \sqrt{15}) \div \sqrt{3} + \sqrt{2}(\sqrt{10} - \sqrt{5})$$

$$100. (3\sqrt{35} - \sqrt{21}) \div \sqrt{7} - \sqrt{45} + 2\sqrt{12}$$

$$101. \sqrt{3}(\sqrt{12} + 1) + \sqrt{2}(\sqrt{6} - \sqrt{2})$$

102.  $\sqrt{18} - \sqrt{3}(3\sqrt{6} - \sqrt{24})$

103.  $\sqrt{6}(2\sqrt{3} - 2) + (\sqrt{18} - \sqrt{54})$

104.  $\sqrt{2}(\sqrt{3} - \sqrt{5}) + \sqrt{2}(\sqrt{5} + \sqrt{3})$

105.  $\sqrt{6}(\sqrt{3} + 2\sqrt{2}) - 4\sqrt{3}$

106.  $-\sqrt{28} + \sqrt{7}\left(\frac{\sqrt{2}}{\sqrt{7}} - 1\right)$

107.  $\sqrt{2}(6 + 3\sqrt{3}) - \frac{4 - 2\sqrt{3}}{\sqrt{2}}$

108.  $\frac{\sqrt{12} - \sqrt{2}}{\sqrt{2}} + \sqrt{2}(\sqrt{2} + \sqrt{3})$

109.  $(\sqrt{18} + 4\sqrt{5}) \div \sqrt{2} - \sqrt{5}\left(\sqrt{2} - \frac{1}{\sqrt{5}}\right)$

110.  $\frac{\sqrt{27} + 9}{\sqrt{3}} - \frac{\sqrt{8} - \sqrt{6}}{\sqrt{2}}$

111.  $\sqrt{24} - \sqrt{\frac{8}{3}} + \frac{\sqrt{45} - \sqrt{30}}{\sqrt{5}}$

112.  $\frac{\sqrt{72} - 18}{\sqrt{12}} - \sqrt{2}(\sqrt{6} - \sqrt{2})$

113.  $\frac{4}{\sqrt{2}} + \frac{9}{\sqrt{3}} - \sqrt{3}(1 - \sqrt{6})$

114.  $\sqrt{3}\left(3\sqrt{2} - \frac{1}{\sqrt{3}}\right) - 2\sqrt{2}\left(\sqrt{2} + \frac{\sqrt{3}}{2}\right)$

115.  $\sqrt{48} - \frac{6}{\sqrt{3}} - 3\sqrt{3}(2 - \sqrt{3})$

116.  $\frac{\sqrt{27} + \sqrt{2}}{\sqrt{3}} + \frac{\sqrt{8} - \sqrt{12}}{\sqrt{2}}$

117.  $\frac{\sqrt{6} + \sqrt{2}}{\sqrt{2}} + \frac{\sqrt{15} - \sqrt{5}}{\sqrt{5}}$

## 정답 및 해설



1)  $3\sqrt{2} + \sqrt{6}$

2)  $\sqrt{6} - 2$

$$\Rightarrow (\sqrt{18} - \sqrt{12}) \div \sqrt{3} = \sqrt{6} - \sqrt{4} = \sqrt{6} - 2$$

3)  $10 - 2\sqrt{10}$

$$\Rightarrow \sqrt{5}(2\sqrt{5} - \sqrt{8}) = 10 - \sqrt{40} = 10 - 2\sqrt{10}$$

4)  $\sqrt{6} + \sqrt{14}$

$$\Rightarrow \sqrt{2}(\sqrt{3} + \sqrt{7}) = \sqrt{2} \times \sqrt{3} + \sqrt{2} \times \sqrt{7} = \sqrt{6} + \sqrt{14}$$

5)  $2\sqrt{6} - \sqrt{3}$

$$\Rightarrow \sqrt{3}(2\sqrt{2} - 1) = \sqrt{3} \times 2\sqrt{2} - \sqrt{3} \times 1 = 2\sqrt{6} - \sqrt{3}$$

6)  $\sqrt{15} + 5\sqrt{3}$

$$\Rightarrow \sqrt{5}(\sqrt{3} + \sqrt{15}) = \sqrt{5} \times \sqrt{3} + \sqrt{5} \times \sqrt{15} \\ = \sqrt{15} + \sqrt{75} = \sqrt{15} + 5\sqrt{3}$$

7)  $2\sqrt{3} - 2$

$$\Rightarrow \sqrt{2}(\sqrt{6} - \sqrt{2}) = \sqrt{2} \times \sqrt{6} - \sqrt{2} \times \sqrt{2} \\ = \sqrt{12} - 2 = 2\sqrt{3} - 2$$

8)  $\sqrt{21} + \sqrt{14}$

$$\Rightarrow (\sqrt{3} + \sqrt{2})\sqrt{7} = \sqrt{3} \times \sqrt{7} + \sqrt{2} \times \sqrt{7} = \sqrt{21} + \sqrt{14}$$

9)  $\sqrt{6} - 2\sqrt{5}$

$$\Rightarrow (\sqrt{3} - \sqrt{10})\sqrt{2} = \sqrt{3} \times \sqrt{2} - \sqrt{10} \times \sqrt{2} \\ = \sqrt{6} - \sqrt{20} = \sqrt{6} - 2\sqrt{5}$$

10)  $3\sqrt{6} - 3\sqrt{2}$

$$\Rightarrow (3\sqrt{2} - \sqrt{6})\sqrt{3} = 3\sqrt{2} \times \sqrt{3} - \sqrt{6} \times \sqrt{3} \\ = 3\sqrt{6} - \sqrt{18} = 3\sqrt{6} - 3\sqrt{2}$$

11)  $5\sqrt{2} + 10$

$$\Rightarrow \sqrt{5}(\sqrt{10} + \sqrt{20}) = \sqrt{5} \times \sqrt{10} + \sqrt{5} \times \sqrt{20} \\ = \sqrt{50} + \sqrt{100} = 5\sqrt{2} + 10$$

12)  $\sqrt{6} - 1$

$$\Rightarrow (2\sqrt{3} - \sqrt{2}) \div \sqrt{2} \\ = (2\sqrt{3} - \sqrt{2}) \times \frac{1}{\sqrt{2}} \\ = 2\sqrt{3} \times \frac{1}{\sqrt{2}} - \sqrt{2} \times \frac{1}{\sqrt{2}} = \sqrt{6} - 1$$

13)  $4 - \sqrt{3}$

$$\Rightarrow (4\sqrt{3} - 3) \div \sqrt{3} = (4\sqrt{3} - 3) \times \frac{1}{\sqrt{3}} \\ = 4\sqrt{3} \times \frac{1}{\sqrt{3}} - 3 \times \frac{1}{\sqrt{3}} \\ = 4 - \sqrt{3}$$

14)  $\sqrt{5} - \sqrt{3}$

$$\Rightarrow (\sqrt{40} - \sqrt{24}) \div \sqrt{8} \\ = (\sqrt{40} - \sqrt{24}) \times \frac{1}{\sqrt{8}} \\ = \sqrt{40} \times \frac{1}{\sqrt{8}} - \sqrt{24} \times \frac{1}{\sqrt{8}} = \sqrt{5} - \sqrt{3}$$

15)  $3 - \sqrt{2}$

$$\Rightarrow (\sqrt{45} - \sqrt{10}) \div \sqrt{5} \\ = (\sqrt{45} - \sqrt{10}) \times \frac{1}{\sqrt{5}} \\ = \sqrt{45} \times \frac{1}{\sqrt{5}} - \sqrt{10} \times \frac{1}{\sqrt{5}} \\ = \sqrt{9} - \sqrt{2} = 3 - \sqrt{2}$$

16)  $2\sqrt{5} - \sqrt{6}$

$$\Rightarrow (2\sqrt{15} - \sqrt{18}) \div \sqrt{3} \\ = (2\sqrt{15} - \sqrt{18}) \times \frac{1}{\sqrt{3}} \\ = 2\sqrt{15} \times \frac{1}{\sqrt{3}} - \sqrt{18} \times \frac{1}{\sqrt{3}} = 2\sqrt{5} - \sqrt{6}$$

17)  $-4 + \sqrt{5}$

$$\Rightarrow (\sqrt{48} - \sqrt{15}) \div (-\sqrt{3}) \\ = (\sqrt{48} - \sqrt{15}) \times \left(-\frac{1}{\sqrt{3}}\right) \\ = \sqrt{48} \times \left(-\frac{1}{\sqrt{3}}\right) - \sqrt{15} \times \left(-\frac{1}{\sqrt{3}}\right) \\ = -\sqrt{16} + \sqrt{5} = -4 + \sqrt{5}$$

18)  $2\sqrt{2} - \sqrt{6}$

$$\Rightarrow (4 - 2\sqrt{3}) \div \sqrt{2} = (4 - 2\sqrt{3}) \times \frac{1}{\sqrt{2}} \\ = 4 \times \frac{1}{\sqrt{2}} - 2\sqrt{3} \times \frac{1}{\sqrt{2}} \\ = 2\sqrt{2} - \sqrt{6}$$

19)  $4 - 2\sqrt{3}$

$$\Rightarrow (\sqrt{80} - \sqrt{60}) \div \sqrt{5} \\ = (\sqrt{80} - \sqrt{60}) \times \frac{1}{\sqrt{5}} \\ = \sqrt{80} \times \frac{1}{\sqrt{5}} - \sqrt{60} \times \frac{1}{\sqrt{5}} \\ = \sqrt{16} - \sqrt{12} = 4 - 2\sqrt{3}$$

20)  $\sqrt{6} - \sqrt{10}$

$$\Rightarrow \sqrt{2}(\sqrt{3} - \sqrt{5}) = \sqrt{2}\sqrt{3} - \sqrt{2}\sqrt{5} = \sqrt{6} - \sqrt{10}$$

21)  $\sqrt{15} + \sqrt{21}$

$$\Rightarrow \sqrt{3}(\sqrt{5} + \sqrt{7}) = \sqrt{3}\sqrt{5} + \sqrt{3}\sqrt{7} = \sqrt{15} + \sqrt{21}$$

22)  $-2-2\sqrt{3}$

$$\Rightarrow -\sqrt{2}(\sqrt{2}+\sqrt{6}) = -\sqrt{2}\sqrt{2} - \sqrt{2}\sqrt{6} \\ = -\sqrt{4} - \sqrt{12} = -2-2\sqrt{3}$$

23)  $\sqrt{15}-\sqrt{35}$

$$\Rightarrow \sqrt{5}(\sqrt{3}-\sqrt{7}) = \sqrt{5}\sqrt{3} - \sqrt{5}\sqrt{7} = \sqrt{15} - \sqrt{35}$$

24)  $-2\sqrt{6}-2\sqrt{22}$

$$\Rightarrow -2\sqrt{2}(\sqrt{3}+\sqrt{11}) = -2\sqrt{2}\sqrt{3} - 2\sqrt{2}\sqrt{11} \\ = -2\sqrt{6} - 2\sqrt{22}$$

25)  $2\sqrt{21}+7$

$$\Rightarrow \sqrt{7}(2\sqrt{3}+\sqrt{7}) = 2\sqrt{7}\sqrt{3} + \sqrt{7}\sqrt{7} = 2\sqrt{21}+7$$

26)  $\sqrt{35}+\sqrt{15}$

$$\Rightarrow (\sqrt{7}+\sqrt{3})\sqrt{5} = \sqrt{7}\sqrt{5} + \sqrt{3}\sqrt{5} = \sqrt{35} + \sqrt{15}$$

27)  $\sqrt{22}+2\sqrt{6}$

$$\Rightarrow (\sqrt{11}+2\sqrt{3})\sqrt{2} = \sqrt{11}\sqrt{2} + 2\sqrt{3}\sqrt{2} \\ = \sqrt{22} + 2\sqrt{6}$$

28)  $\sqrt{15}-2\sqrt{6}$

$$\Rightarrow (\sqrt{5}-2\sqrt{2})\sqrt{3} = \sqrt{5}\sqrt{3} - 2\sqrt{2}\sqrt{3} = \sqrt{15} - 2\sqrt{6}$$

29)  $3\sqrt{14}+4\sqrt{21}$

$$\Rightarrow (3\sqrt{2}+4\sqrt{3})\sqrt{7} = 3\sqrt{2}\sqrt{7} + 4\sqrt{3}\sqrt{7} \\ = 3\sqrt{14} + 4\sqrt{21}$$

30)  $20-\sqrt{35}$

$$\Rightarrow (4\sqrt{5}-\sqrt{7})\sqrt{5} = 4\sqrt{5}\sqrt{5} - \sqrt{7}\sqrt{5} = 20 - \sqrt{35}$$

31)  $\sqrt{6}-9$

$$\Rightarrow (\sqrt{2}-3\sqrt{3})\sqrt{3} = \sqrt{2}\sqrt{3} - 3\sqrt{3}\sqrt{3} = \sqrt{6} - 9$$

32)  $12\sqrt{3}-45\sqrt{2}$

$$\Rightarrow 3\sqrt{6}(2\sqrt{2}-5\sqrt{3}) = 6\sqrt{6}\sqrt{2} - 15\sqrt{6}\sqrt{3} \\ = 6\sqrt{12} - 15\sqrt{18} = 12\sqrt{3} - 45\sqrt{2}$$

33)  $-9\sqrt{2}-10\sqrt{3}$

$$\Rightarrow (-3\sqrt{3}-5\sqrt{2})\sqrt{6} = -3\sqrt{3}\sqrt{6} - 5\sqrt{2}\sqrt{6} \\ = -3\sqrt{18} - 5\sqrt{12} = -9\sqrt{2} - 10\sqrt{3}$$

34)  $5\sqrt{6}+6\sqrt{2}$

$$\Rightarrow (5\sqrt{42}+6\sqrt{14}) \div \sqrt{7} = (5\sqrt{42}+6\sqrt{14}) \times \frac{1}{\sqrt{7}} \\ = 5\sqrt{\frac{42}{7}} + 6\sqrt{\frac{14}{7}} = 5\sqrt{6} + 6\sqrt{2}$$

35)  $-\frac{3\sqrt{2}}{2} + \frac{5\sqrt{3}}{3}$

$$\Rightarrow (-3\sqrt{3}+5\sqrt{2}) \div \sqrt{6} = (-3\sqrt{3}+5\sqrt{2}) \times \frac{1}{\sqrt{6}} \\ = -3\sqrt{\frac{3}{6}} + 5\sqrt{\frac{2}{6}} = -3\sqrt{\frac{1}{2}} + 5\sqrt{\frac{1}{3}} = -\frac{3\sqrt{2}}{2} + \frac{5\sqrt{3}}{3}$$

36)  $4\sqrt{6}+6\sqrt{15}$

$$\Rightarrow 2\sqrt{3}(\sqrt{8}+3\sqrt{5}) = 2\sqrt{3}\sqrt{8} + 6\sqrt{3}\sqrt{5} \\ = 2\sqrt{24} + 6\sqrt{15} = 4\sqrt{6} + 6\sqrt{15}$$

37)  $-4\sqrt{10}+3\sqrt{30}$

$$\Rightarrow -\sqrt{5}(4\sqrt{2}-\sqrt{54}) = -4\sqrt{5}\sqrt{2} + \sqrt{5}\sqrt{54} \\ = -4\sqrt{10} + \sqrt{270} = -4\sqrt{10} + 3\sqrt{30}$$

38)  $3\sqrt{2}-2\sqrt{6}$

$$\Rightarrow (\sqrt{6}-2\sqrt{2})\sqrt{3} = \sqrt{6}\sqrt{3} - 2\sqrt{2}\sqrt{3} \\ = \sqrt{18} - 2\sqrt{6} = 3\sqrt{2} - 2\sqrt{6}$$

39)  $5\sqrt{15}+4\sqrt{10}$

$$\Rightarrow (\sqrt{75}+\sqrt{32})\sqrt{5} = \sqrt{75}\sqrt{5} + \sqrt{32}\sqrt{5} \\ = \sqrt{375} + \sqrt{160} = 5\sqrt{15} + 4\sqrt{10}$$

40)  $2\sqrt{30}+8\sqrt{3}$

$$\Rightarrow 2\sqrt{6}(\sqrt{5}+\sqrt{8}) = 2\sqrt{6}\sqrt{5} + 2\sqrt{6}\sqrt{8} \\ = 2\sqrt{30} + 2\sqrt{48} = 2\sqrt{30} + 8\sqrt{3}$$

41)  $-6\sqrt{6}-18$

$$\Rightarrow -3\sqrt{2}(\sqrt{12}+3\sqrt{2}) = -3\sqrt{2}\sqrt{12} - 9\sqrt{2}\sqrt{2} \\ = -3\sqrt{24} - 9\sqrt{2} = -6\sqrt{6} - 18$$

42)  $6\sqrt{15}-6\sqrt{10}$

$$\Rightarrow \sqrt{6}(3\sqrt{10}-2\sqrt{15}) = 3\sqrt{6}\sqrt{10} - 2\sqrt{6}\sqrt{15} \\ = 3\sqrt{60} - 2\sqrt{90} = 6\sqrt{15} - 6\sqrt{10}$$

43)  $18\sqrt{2}+27$

$$\Rightarrow 3\sqrt{3}(2\sqrt{6}+\sqrt{27}) = 6\sqrt{3}\sqrt{6} + 3\sqrt{3}\sqrt{27} \\ = 6\sqrt{18} + 3\sqrt{81} = 18\sqrt{2} + 27$$

44)  $10+4\sqrt{10}$

$$\Rightarrow (2\sqrt{5}+\sqrt{32})\sqrt{5} = 2\sqrt{5}\sqrt{5} + \sqrt{32}\sqrt{5} \\ = 2\sqrt{25} + \sqrt{160} = 10 + 4\sqrt{10}$$

45)  $-6\sqrt{3}+4\sqrt{6}$

$$\Rightarrow (-3\sqrt{6}+4\sqrt{3})\sqrt{2} = -3\sqrt{6}\sqrt{2} + 4\sqrt{3}\sqrt{2} \\ = -3\sqrt{12} + 4\sqrt{6} = -6\sqrt{3} + 4\sqrt{6}$$

46)  $21\sqrt{5}-20\sqrt{3}$

$$\Rightarrow (7\sqrt{3}-4\sqrt{5})\sqrt{15} = 7\sqrt{3}\sqrt{15} - 4\sqrt{5}\sqrt{15} \\ = 7\sqrt{45} - 4\sqrt{75} = 21\sqrt{5} - 20\sqrt{3}$$

47)  $15\sqrt{2}+6$

$$\Rightarrow (5\sqrt{6}+\sqrt{12})\sqrt{3} = 5\sqrt{6}\sqrt{3} + \sqrt{12}\sqrt{3} \\ = 15\sqrt{2} + 6$$



$$= 5\sqrt{18} + \sqrt{36} = 15\sqrt{2} + 6$$

$$48) \sqrt{2} + 2$$

$$\Rightarrow (\sqrt{6} + \sqrt{12}) \div \sqrt{3} = (\sqrt{6} + \sqrt{12}) \times \frac{1}{\sqrt{3}}$$

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

$$49) \sqrt{2} + \sqrt{3}$$

$$\Rightarrow (\sqrt{12} + \sqrt{18}) \div \sqrt{6} = (\sqrt{12} + \sqrt{18}) \times \frac{1}{\sqrt{6}}$$

$$= \sqrt{\frac{12}{6}} + \sqrt{\frac{18}{6}} = \sqrt{2} + \sqrt{3}$$

$$50) 2 - \frac{\sqrt{6}}{2}$$

$$\Rightarrow (\sqrt{8} - \sqrt{3}) \div \sqrt{2} = (\sqrt{8} - \sqrt{3}) \times \frac{1}{\sqrt{2}}$$

$$= \sqrt{\frac{8}{2}} - \sqrt{\frac{3}{2}} = 2 - \frac{\sqrt{6}}{2}$$

$$51) 2\sqrt{3} + \frac{\sqrt{15}}{5}$$

$$\Rightarrow (2\sqrt{15} + \sqrt{3}) \div \sqrt{5} = (2\sqrt{15} + \sqrt{3}) \times \frac{1}{\sqrt{5}}$$

$$= 2\sqrt{\frac{15}{5}} + \sqrt{\frac{3}{5}} = 2\sqrt{3} + \frac{\sqrt{15}}{5}$$

$$52) 3\sqrt{3} - 4\sqrt{2}$$

$$\Rightarrow (3\sqrt{21} - 4\sqrt{14}) \div \sqrt{7} = (3\sqrt{21} - 4\sqrt{14}) \times \frac{1}{\sqrt{7}}$$

$$= 3\sqrt{\frac{21}{7}} - 4\sqrt{\frac{14}{7}} = 3\sqrt{3} - 4\sqrt{2}$$

$$53) 1 - \frac{4\sqrt{3}}{3}$$

$$\Rightarrow (\sqrt{6} - 4\sqrt{2}) \div \sqrt{6} = (\sqrt{6} - 4\sqrt{2}) \times \frac{1}{\sqrt{6}}$$

$$= \sqrt{\frac{6}{6}} - 4\sqrt{\frac{2}{6}} = 1 - \frac{4\sqrt{3}}{3}$$

$$54) 2\sqrt{6} - 2\sqrt{2}$$

$$\Rightarrow (6\sqrt{2} - 2\sqrt{6}) \div \sqrt{3} = (6\sqrt{2} - 2\sqrt{6}) \times \frac{1}{\sqrt{3}}$$

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

$$55) \frac{3\sqrt{30}}{10} - \sqrt{5}$$

$$\Rightarrow (3\sqrt{3} - 5\sqrt{2}) \div \sqrt{10} = (3\sqrt{3} - 5\sqrt{2}) \times \frac{1}{\sqrt{10}}$$

$$= 3\sqrt{\frac{3}{10}} - 5\sqrt{\frac{2}{10}} = \frac{3\sqrt{30}}{10} - \sqrt{5}$$

$$56) \frac{\sqrt{15} - 3}{3}$$

$$57) \sqrt{3} + 2$$

$$\Rightarrow \frac{\sqrt{6} + \sqrt{8}}{\sqrt{2}} = \frac{2\sqrt{3} + 4}{2} = \sqrt{3} + 2$$

$$58) \frac{\sqrt{5}}{5} - \frac{\sqrt{2}}{2}$$

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

$$59) -\frac{3\sqrt{5}}{5}$$

$$\Rightarrow \frac{\sqrt{3} - 2\sqrt{12}}{\sqrt{15}} = \frac{\sqrt{3} - 4\sqrt{3}}{\sqrt{15}}$$

$$= \frac{-3\sqrt{3} \times \sqrt{15}}{\sqrt{15} \times \sqrt{15}} = \frac{-9\sqrt{5}}{15} = -\frac{3\sqrt{5}}{5}$$

$$60) \frac{2+6\sqrt{3}}{3}$$

$$\Rightarrow \frac{\sqrt{8} + 6\sqrt{6}}{3\sqrt{2}} = \frac{4 + 12\sqrt{3}}{6} = \frac{2+6\sqrt{3}}{3}$$

$$61) \frac{\sqrt{6} + 2\sqrt{3}}{2}$$

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

$$62) 4 - \sqrt{3}$$

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

$$63) 5\sqrt{2} + \sqrt{5}$$

$$\Rightarrow \frac{10 + \sqrt{10}}{\sqrt{2}} = \frac{(10 + \sqrt{10}) \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}}$$

$$= \frac{10\sqrt{2} + 2\sqrt{5}}{2} = 5\sqrt{2} + \sqrt{5}$$

$$64) 2\sqrt{3} - 2$$

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

$$65) \sqrt{7} + \sqrt{3}$$

$$\Rightarrow \frac{\sqrt{35} + \sqrt{15}}{\sqrt{5}} = \frac{(\sqrt{35} + \sqrt{15}) \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}}$$

$$= \frac{5\sqrt{7} + 5\sqrt{3}}{5} = \sqrt{7} + \sqrt{3}$$

$$66) \frac{2\sqrt{3} - 3\sqrt{2}}{6}$$

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

$$67) \frac{2\sqrt{6}-6\sqrt{3}}{\sqrt{3}} = \frac{6\sqrt{2}-18}{\sqrt{3}} = \frac{(6\sqrt{2}-18) \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ = \frac{6\sqrt{6}-18\sqrt{3}}{3} = 2\sqrt{6}-6\sqrt{3}$$

$$68) \frac{\sqrt{3}-2}{2} \\ \Rightarrow \frac{\sqrt{6}-\sqrt{8}}{2\sqrt{2}} = \frac{\sqrt{6}-2\sqrt{2}}{2\sqrt{2}} = \frac{(\sqrt{6}-2\sqrt{2}) \times \sqrt{2}}{2\sqrt{2} \times \sqrt{2}} \\ = \frac{2\sqrt{3}-4}{4} = \frac{\sqrt{3}-2}{2}$$

$$69) \frac{1-\sqrt{2}}{2} \\ \Rightarrow \frac{\sqrt{3}-\sqrt{6}}{\sqrt{12}} = \frac{\sqrt{3}-\sqrt{6}}{2\sqrt{3}} = \frac{(\sqrt{3}-\sqrt{6}) \times \sqrt{3}}{2\sqrt{3} \times \sqrt{3}} \\ = \frac{3-3\sqrt{2}}{6} = \frac{1-\sqrt{2}}{2}$$

$$70) \frac{2-\sqrt{5}}{\sqrt{12}-\sqrt{15}} \\ \Rightarrow \frac{\sqrt{3}}{2\sqrt{3}-\sqrt{15}} = \frac{(2\sqrt{3}-\sqrt{15}) \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ = \frac{6-3\sqrt{5}}{3} = 2-\sqrt{5}$$

$$71) \frac{6+\sqrt{10}}{2} \\ \Rightarrow \frac{\sqrt{54}+\sqrt{15}}{\sqrt{6}} = \frac{3\sqrt{6}+\sqrt{15}}{\sqrt{6}} = \frac{(3\sqrt{6}+\sqrt{15}) \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} \\ = \frac{18+3\sqrt{10}}{6} = \frac{6+\sqrt{10}}{2}$$

$$72) \frac{2-\sqrt{2}}{4} \\ \Rightarrow \frac{2\sqrt{3}-\sqrt{6}}{\sqrt{48}} = \frac{2\sqrt{3}-\sqrt{6}}{4\sqrt{3}} = \frac{(2\sqrt{3}-\sqrt{6}) \times \sqrt{3}}{4\sqrt{3} \times \sqrt{3}} \\ = \frac{6-3\sqrt{2}}{12} = \frac{2-\sqrt{2}}{4}$$

$$73) 4-\sqrt{2}$$

$$74) 2\sqrt{2}+2$$

$$75) \frac{\sqrt{2}+1}{3} \\ \Rightarrow \frac{4+2\sqrt{2}}{3\sqrt{8}} = \frac{(4+2\sqrt{2}) \times \sqrt{8}}{3 \times 8} = \frac{8\sqrt{2}+8}{24} = \frac{\sqrt{2}+1}{3}$$

$$76) \frac{\sqrt{6}-\sqrt{2}}{\sqrt{12}} = \frac{(6\sqrt{2}-\sqrt{24})\sqrt{12}}{\sqrt{12} \times \sqrt{12}} \\ = \frac{12\sqrt{6}-12\sqrt{2}}{12} = \sqrt{6}-\sqrt{2}$$

$$77) \frac{2\sqrt{3}+\sqrt{15}}{\sqrt{3}} = \frac{(6+3\sqrt{5})\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{6\sqrt{3}+3\sqrt{15}}{3} \\ = 2\sqrt{3}+\sqrt{15}$$

$$78) \frac{2\sqrt{42}-9\sqrt{2}}{6} \\ \Rightarrow \frac{2\sqrt{7}-3\sqrt{3}}{\sqrt{6}} = \frac{(2\sqrt{7}-3\sqrt{3})\sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{2\sqrt{42}-9\sqrt{2}}{6}$$

$$79) \frac{\sqrt{6}+\sqrt{10}}{2} \\ \Rightarrow \frac{\sqrt{3}+\sqrt{5}}{\sqrt{2}} = \frac{(\sqrt{3}+\sqrt{5})\sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{6}+\sqrt{10}}{2}$$

$$80) \frac{\sqrt{15}+\sqrt{35}}{5} \\ \Rightarrow \frac{\sqrt{3}+\sqrt{7}}{\sqrt{5}} = \frac{(\sqrt{3}+\sqrt{7})\sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{15}+\sqrt{35}}{5}$$

$$81) \frac{\sqrt{30}+2\sqrt{6}}{6} \\ \Rightarrow \frac{\sqrt{5}+2}{\sqrt{6}} = \frac{(\sqrt{5}+2)\sqrt{6}}{\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{30}+2\sqrt{6}}{6}$$

$$82) \frac{\sqrt{6}-\sqrt{15}}{3} \\ \Rightarrow \frac{\sqrt{2}-\sqrt{5}}{\sqrt{3}} = \frac{(\sqrt{2}-\sqrt{5})\sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{\sqrt{6}-\sqrt{15}}{3}$$

$$83) \frac{\sqrt{30}-\sqrt{15}}{5} \\ \Rightarrow \frac{\sqrt{6}-\sqrt{3}}{\sqrt{5}} = \frac{(\sqrt{6}-\sqrt{3})\sqrt{5}}{\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{30}-\sqrt{15}}{5}$$

$$84) \frac{4\sqrt{2}-\sqrt{10}}{2} \\ \Rightarrow \frac{4-\sqrt{5}}{\sqrt{2}} = \frac{(4-\sqrt{5})\sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{4\sqrt{2}-\sqrt{10}}{2}$$

$$85) \frac{2\sqrt{10}+\sqrt{30}}{5}$$

$$\Rightarrow \frac{2\sqrt{2}+\sqrt{6}}{\sqrt{5}} = \frac{(2\sqrt{2}+\sqrt{6})\sqrt{5}}{\sqrt{5}\times\sqrt{5}} = \frac{2\sqrt{10}+\sqrt{30}}{5}$$

$$86) \frac{2\sqrt{15}+12\sqrt{2}}{3}$$

$$\begin{aligned}\Rightarrow \frac{2\sqrt{5}+4\sqrt{6}}{\sqrt{3}} &= \frac{(2\sqrt{5}+4\sqrt{6})\sqrt{3}}{\sqrt{3}\times\sqrt{3}} \\ &= \frac{2\sqrt{15}+4\sqrt{18}}{3} = \frac{2\sqrt{15}+12\sqrt{2}}{3}\end{aligned}$$

$$87) \frac{4\sqrt{3}+3\sqrt{6}}{4}$$

$$\begin{aligned}\Rightarrow \frac{2\sqrt{6}+3\sqrt{3}}{\sqrt{8}} &= \frac{(2\sqrt{6}+3\sqrt{3})\sqrt{8}}{\sqrt{8}\times\sqrt{8}} = \frac{2\sqrt{48}+3\sqrt{24}}{8} \\ &= \frac{8\sqrt{3}+6\sqrt{6}}{8} = \frac{4\sqrt{3}+3\sqrt{6}}{4}\end{aligned}$$

$$88) \frac{6\sqrt{7}+35\sqrt{2}}{14}$$

$$\Rightarrow \frac{3\sqrt{2}+5\sqrt{7}}{\sqrt{14}} = \frac{(3\sqrt{2}+5\sqrt{7})\sqrt{14}}{\sqrt{14}\times\sqrt{14}} = \frac{6\sqrt{7}+35\sqrt{2}}{14}$$

$$89) 2\sqrt{2}-\sqrt{3}$$

$$\begin{aligned}\Rightarrow \frac{4\sqrt{3}-\sqrt{18}}{\sqrt{6}} &= \frac{(4\sqrt{3}-\sqrt{18})\sqrt{6}}{\sqrt{6}\times\sqrt{6}} = \frac{12\sqrt{2}-6\sqrt{3}}{6} \\ &= 2\sqrt{2}-\sqrt{3}\end{aligned}$$

$$90) \sqrt{10}-2\sqrt{2}$$

$$\begin{aligned}\Rightarrow \frac{5\sqrt{2}-2\sqrt{10}}{\sqrt{5}} &= \frac{(5\sqrt{2}-2\sqrt{10})\sqrt{5}}{\sqrt{5}\times\sqrt{5}} \\ &= \frac{5\sqrt{10}-10\sqrt{2}}{5} = \sqrt{10}-2\sqrt{2}\end{aligned}$$

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

$$\begin{aligned}\Rightarrow \frac{5\sqrt{3}-2\sqrt{6}}{\sqrt{12}} &= \frac{(5\sqrt{3}-2\sqrt{6})\sqrt{12}}{\sqrt{12}\times\sqrt{12}} = \frac{5\sqrt{36}-2\sqrt{72}}{12} \\ &= \frac{30-12\sqrt{2}}{12} = \frac{5-2\sqrt{2}}{2}\end{aligned}$$

$$92) \frac{10\sqrt{6}-3\sqrt{30}}{10}$$

$$\begin{aligned}\Rightarrow \frac{2\sqrt{15}-3\sqrt{3}}{\sqrt{10}} &= \frac{(2\sqrt{15}-3\sqrt{3})\sqrt{10}}{\sqrt{10}\times\sqrt{10}} \\ &= \frac{2\sqrt{150}-3\sqrt{30}}{10} = \frac{10\sqrt{6}-3\sqrt{30}}{10}\end{aligned}$$

$$93) 2$$

$$\begin{aligned}\Rightarrow \frac{\sqrt{20}-\sqrt{15}}{\sqrt{5}} + \sqrt{3} &= \frac{(\sqrt{20}-\sqrt{15})\sqrt{5}}{\sqrt{5}\times\sqrt{5}} + \sqrt{3} \\ &= \frac{10-5\sqrt{3}}{5} + \sqrt{3} \\ &= 2 - \sqrt{3} + \sqrt{3} = 2\end{aligned}$$

$$94) 4+\sqrt{3}$$

$$\begin{aligned}\Rightarrow \frac{4\sqrt{3}-3}{\sqrt{3}} + \sqrt{12} &= \frac{12-3\sqrt{3}}{3} + 2\sqrt{3} \\ &= 4 - \sqrt{3} + 2\sqrt{3} = 4 + \sqrt{3}\end{aligned}$$

$$95) 1+\sqrt{2}$$

$$\begin{aligned}\Rightarrow \frac{\sqrt{12}-\sqrt{6}}{\sqrt{3}} + 2\sqrt{2}-1 &= \frac{6-3\sqrt{2}}{3} + 2\sqrt{2}-1 \\ &= 2 - \sqrt{2} + 2\sqrt{2} - 1 \\ &= 1 + \sqrt{2}\end{aligned}$$

$$96) 22-9\sqrt{3}$$

$$\begin{aligned}\Rightarrow 4\sqrt{3}(\sqrt{3}-1) + 5(2-\sqrt{3}) &= 12-4\sqrt{3}+10-5\sqrt{3} = 22-9\sqrt{3}\end{aligned}$$

$$97) 10\sqrt{7}-3$$

$$98) 6+5\sqrt{5}$$

$$99) \sqrt{10}+\sqrt{5}$$

$$100) 3\sqrt{3}$$

$$101) 4+3\sqrt{3}$$

$$\begin{aligned}\Rightarrow \sqrt{3}(\sqrt{12}+1) + \sqrt{2}(\sqrt{6}-\sqrt{2}) &= 6 + \sqrt{3} + 2\sqrt{3} - 2 = 4 + 3\sqrt{3}\end{aligned}$$

$$102) 0$$

$$\Rightarrow \sqrt{18} - \sqrt{3}(3\sqrt{6} - \sqrt{24}) = 3\sqrt{2} - 9\sqrt{2} + 6\sqrt{2} = 0$$

$$103) 9\sqrt{2}-5\sqrt{6}$$

$$\begin{aligned}\Rightarrow \sqrt{6}(2\sqrt{3}-2) + (\sqrt{18}-\sqrt{54}) &= 6\sqrt{2}-2\sqrt{6}+3\sqrt{2}-3\sqrt{6} = 9\sqrt{2}-5\sqrt{6}\end{aligned}$$

$$104) 2\sqrt{6}$$

$$105) 3\sqrt{2}$$

$$\Rightarrow \sqrt{6}(\sqrt{3}+2\sqrt{2}) - 4\sqrt{3} = 3\sqrt{2} + 4\sqrt{3} - 4\sqrt{3} = 3\sqrt{2}$$

$$106) \sqrt{2}-3\sqrt{7}$$

$$\Rightarrow -\sqrt{28} + \sqrt{7}\left(\frac{\sqrt{2}}{\sqrt{7}}-1\right) = -2\sqrt{7} + \sqrt{2} - \sqrt{7} = \sqrt{2} - 3\sqrt{7}$$

$$107) 4\sqrt{2}+4\sqrt{6}$$

$$\begin{aligned}\Rightarrow \sqrt{2}(6+3\sqrt{3}) - \frac{4-2\sqrt{3}}{\sqrt{2}} &= 6\sqrt{2}+3\sqrt{6} - \frac{4\sqrt{2}-2\sqrt{6}}{2} \\ &= 6\sqrt{2}+3\sqrt{6} - (2\sqrt{2}-\sqrt{6}) = 4\sqrt{2}+4\sqrt{6}\end{aligned}$$

$$108) 2\sqrt{6}+1$$

$$\begin{aligned} \Rightarrow & \frac{\sqrt{12}-\sqrt{2}}{\sqrt{2}} + \sqrt{2}(\sqrt{2}+\sqrt{3}) \\ &= \frac{2\sqrt{6}-2}{2} + 2 + \sqrt{6} \\ &= \sqrt{6}-1+2+\sqrt{6}=2\sqrt{6}+1 \end{aligned}$$

$$109) 4+\sqrt{10}$$

$$\begin{aligned} \Rightarrow & (\sqrt{18}+4\sqrt{5}) \div \sqrt{2}-\sqrt{5}\left(\sqrt{2}-\frac{1}{\sqrt{5}}\right) \\ &= (\sqrt{18}+4\sqrt{5}) \times \frac{1}{\sqrt{2}} - \sqrt{5}\left(\sqrt{2}-\frac{1}{\sqrt{5}}\right) \\ &= 3+2\sqrt{10}-\sqrt{10}+1=4+\sqrt{10} \end{aligned}$$

$$110) 1+4\sqrt{3}$$

$$\begin{aligned} \Rightarrow & \frac{\sqrt{27}+9}{\sqrt{3}} - \frac{\sqrt{8}-\sqrt{6}}{\sqrt{2}} \\ &= \frac{3\sqrt{3}+9}{\sqrt{3}} - \frac{2\sqrt{2}-\sqrt{6}}{\sqrt{2}} \\ &= \frac{9+9\sqrt{3}}{3} - \frac{4-2\sqrt{3}}{2} \\ &= 3+3\sqrt{3}-(2-\sqrt{3})=1+4\sqrt{3} \end{aligned}$$

$$111) \frac{\sqrt{6}}{3}+3$$

$$\begin{aligned} \Rightarrow & \sqrt{24}-\sqrt{\frac{8}{3}}+\frac{\sqrt{45}-\sqrt{30}}{\sqrt{5}} \\ &= 2\sqrt{6}-\frac{2\sqrt{2}}{\sqrt{3}}+\frac{3\sqrt{5}-\sqrt{30}}{\sqrt{5}} \\ &= 2\sqrt{6}-\frac{2\sqrt{6}}{3}+3-\sqrt{6}=\frac{\sqrt{6}}{3}+3 \end{aligned}$$

$$112) \sqrt{6}-5\sqrt{3}+2$$

$$\begin{aligned} \Rightarrow & \frac{\sqrt{72}-18}{\sqrt{12}} - \sqrt{2}(\sqrt{6}-\sqrt{2}) \\ &= \frac{6\sqrt{2}-18}{2\sqrt{3}} - 2\sqrt{3}+2 = \frac{3\sqrt{2}-9}{\sqrt{3}} - 2\sqrt{3}+2 \\ &= \frac{3\sqrt{6}-9\sqrt{3}}{3} - 2\sqrt{3}+2 \\ &= \sqrt{6}-3\sqrt{3}-2\sqrt{3}+2 = \sqrt{6}-5\sqrt{3}+2 \end{aligned}$$

$$113) 5\sqrt{2}+2\sqrt{3}$$

$$\begin{aligned} \Rightarrow & \frac{4}{\sqrt{2}} + \frac{9}{\sqrt{3}} - \sqrt{3}(1-\sqrt{6}) \\ &= 2\sqrt{2}+3\sqrt{3}-\sqrt{3}+3\sqrt{2}=5\sqrt{2}+2\sqrt{3} \end{aligned}$$

$$114) 2\sqrt{6}-5$$

$$\begin{aligned} \Rightarrow & \sqrt{3}\left(3\sqrt{2}-\frac{1}{\sqrt{3}}\right) - 2\sqrt{2}\left(\sqrt{2}+\frac{\sqrt{3}}{2}\right) \\ &= 3\sqrt{6}-1-4-\sqrt{6}=2\sqrt{6}-5 \end{aligned}$$

$$115) 9-4\sqrt{3}$$

$$\begin{aligned} \Rightarrow & \sqrt{48}-\frac{6}{\sqrt{3}}-3\sqrt{3}(2-\sqrt{3}) \\ &= 4\sqrt{3}-2\sqrt{3}-6\sqrt{3}+9=9-4\sqrt{3} \end{aligned}$$

$$116) 5-\frac{2\sqrt{6}}{3}$$

$$117) 2\sqrt{3}$$

$$\begin{aligned} \Rightarrow & \frac{\sqrt{6}+\sqrt{2}}{\sqrt{2}} + \frac{\sqrt{15}-\sqrt{5}}{\sqrt{5}} \\ &= \frac{(\sqrt{6}+\sqrt{2})\sqrt{2}}{2} + \frac{(\sqrt{15}-\sqrt{5})\sqrt{5}}{5} = \frac{2\sqrt{3}+2}{2} + \frac{5\sqrt{3}-5}{5} \\ &= \sqrt{3}+1+\sqrt{3}-1=2\sqrt{3} \end{aligned}$$