

Simplify.

1.  $\sqrt[3]{2187} - 2\sqrt[3]{24}$

$$\sqrt[3]{27 \cdot 3} - 2\sqrt[3]{8 \cdot 3}$$

$$9\sqrt[3]{3} - 4\sqrt[3]{3}$$

$$\boxed{5\sqrt[3]{3}}$$

2.  $\frac{7\sqrt{3}}{5\sqrt{3}\sqrt{3}} - \frac{8\sqrt{3}}{15}$

$$\frac{7\sqrt{3}}{15} - \frac{8\sqrt{3}}{15} = \boxed{\frac{-\sqrt{3}}{15}}$$

3.  $7\sqrt{3} - \frac{12\sqrt{3}}{\sqrt{3}\sqrt{3}} + \sqrt{75}$

$$7\sqrt{3} - \frac{12\sqrt{3}}{3} + \sqrt{75}$$

$$7\sqrt{3} - 4\sqrt{3} + 5\sqrt{3}$$

$$\boxed{8\sqrt{3}}$$

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

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

$$5 - 2\sqrt{15} + 3$$

$$\boxed{8 - 2\sqrt{15}}$$

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

$$5 - 3$$

$$\boxed{2}$$

6.  $(3\sqrt{5} + 7)(3\sqrt{5} - 7)$

$$45 - 49$$

$$\boxed{-4}$$

$$7. \frac{2}{\sqrt[3]{9}} \cdot \frac{\sqrt[3]{3}}{\sqrt[3]{3}} =$$

$$\frac{2\sqrt[3]{3}}{3}$$

$$8. \frac{7}{\sqrt[5]{128}} = \frac{7}{\sqrt[5]{32 \cdot 5 \cdot 4}}$$

$$\frac{7}{2 \cdot \sqrt[5]{4}} \cdot \frac{\sqrt[5]{8}}{\sqrt[5]{8}}$$

$$\frac{7\sqrt[5]{8}}{4}$$

$$9. \frac{7}{\sqrt[4]{49}} \cdot \frac{\sqrt[4]{49}}{\sqrt[4]{49}}$$

$$\frac{7\sqrt[4]{49}}{7} = \sqrt[4]{49}$$

$$\sqrt[4]{7^2} = \boxed{\sqrt{7}}$$

$$10. \frac{4}{3-2\sqrt{2}} \cdot \frac{(3+2\sqrt{2})}{(3+2\sqrt{2})}$$

$$\frac{12+8\sqrt{2}}{9-8}$$

$$\boxed{12+8\sqrt{2}}$$

$$11. \frac{(\sqrt{3}-1)(\sqrt{2}+1)}{(\sqrt{2}-1)(\sqrt{2}+1)}$$

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

$$\boxed{\sqrt{6}+\sqrt{3}-\sqrt{2}-1}$$

$$12. \frac{4\sqrt{7}+3\sqrt{2}}{5\sqrt{2}+2\sqrt{7}} \cdot \frac{(5\sqrt{2}-2\sqrt{7})}{(5\sqrt{2}-2\sqrt{7})}$$

$$\frac{20\sqrt{14}-56+30-6\sqrt{14}}{50-28}$$

$$\frac{14\sqrt{14}-26}{22} = \boxed{\frac{7\sqrt{14}-13}{11}}$$

$$13. \frac{\left(1+\frac{1}{\sqrt{3}}\right) \cdot \sqrt{3}}{\left(1-\frac{1}{\sqrt{3}}\right) \cdot \sqrt{3}}$$

$$\frac{(\sqrt{3}+1)(\sqrt{3}+1)}{(\sqrt{3}-1)(\sqrt{3}+1)}$$

$$\frac{3+2\sqrt{3}+1}{3-1}$$

$$\frac{4+2\sqrt{3}}{2} = \boxed{2+\sqrt{3}}$$

$$14. \frac{\left(1-\frac{1}{\sqrt{5}}\right) \cdot \sqrt{5}}{\left(1+\frac{1}{\sqrt{5}}\right) \cdot \sqrt{5}} = \frac{(\sqrt{5}-1)(\sqrt{5}-1)}{(\sqrt{5}+1)(\sqrt{5}-1)}$$

$$\frac{5-2\sqrt{5}+1}{5-1} = \frac{6-2\sqrt{5}}{4}$$

$$\boxed{\frac{3-\sqrt{5}}{2}}$$