

$$\boxed{7-3}$$

$$\begin{aligned} \#1 \quad & (3\sqrt{2}-9)(3\sqrt{2}+9) = \\ & (3\sqrt{2})^2 - 9^2 \\ & 9 \cdot 2 - 81 = 18 - 81 = \boxed{-63} \end{aligned}$$

$$\#2 \quad 9\sqrt{3} + 2\sqrt{3} = 11\sqrt{3}$$

$$\#5 \quad \text{not possible}$$

$$\#6 \quad \text{not possible}$$

$$\begin{aligned} \#7 \quad & \sqrt[4]{xy} - \sqrt[3]{xy} \\ & \boxed{11\sqrt{xy}} \end{aligned}$$

$$\begin{aligned} \#8 \quad & \frac{2}{2\sqrt{3}-4} \cdot \frac{2\sqrt{3}+4}{2\sqrt{3}+4} = \frac{4\sqrt{3}+8}{(2\sqrt{3})^2 - 4^2} \\ & = \frac{4\sqrt{3}+8}{4 \cdot 3 - 16} = \frac{4\sqrt{3}+8}{12-16} = \frac{4\sqrt{3}+8}{-4} \\ & = \boxed{-\sqrt{3}-2} \end{aligned}$$

$$\begin{aligned} \#12 \quad & 3\sqrt{32} + 2\sqrt{50} \\ & \quad \quad \quad \begin{array}{cc} \wedge & \wedge \\ 16 & 25 \end{array} \\ & 12\sqrt{2} + 10\sqrt{2} = \boxed{22\sqrt{2}} \end{aligned}$$

$$\begin{aligned} \#14 \quad & \sqrt[3]{81} - \sqrt[3]{3} \\ & \quad \quad \quad \begin{array}{c} \wedge \\ 27 \end{array} \\ & \sqrt[3]{3} - \sqrt[3]{3} = \boxed{0} \end{aligned}$$

$$\begin{aligned} \#16. \quad & (1-\sqrt{5})(2+\sqrt{5}) \\ & 2 - 2\sqrt{5} + \sqrt{5} - 5 = \boxed{-3-\sqrt{5}} \end{aligned}$$

$$\begin{aligned} \#19 \quad & (4-2\sqrt{3})^2 = \\ & 16 - 2 \cdot 4 \cdot 2\sqrt{3} + (2\sqrt{3})^2 \\ & 16 - 16\sqrt{3} + 4 \cdot 3 \\ & \boxed{28-16\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \#22 \quad & \sqrt{28} + 4\sqrt{63} - 2\sqrt{7} \\ & \quad \quad \quad \begin{array}{cc} \wedge & \wedge \\ 4 & 9 \end{array} \\ & 2\sqrt{7} + 4 \cdot 3\sqrt{7} - 2\sqrt{7} \\ & \quad \quad \quad \begin{array}{c} \wedge \\ 12 \end{array} \\ & = \boxed{12\sqrt{7}} \end{aligned}$$

$$\begin{aligned} \#24. \quad & 3\sqrt{12} + 7\sqrt{75} - \sqrt{54} \\ & \quad \quad \quad \begin{array}{cc} \wedge & \wedge \\ 4 & 25 \end{array} \quad \begin{array}{c} \wedge \\ 9 \end{array} \\ & 6\sqrt{3} + 7 \cdot 5\sqrt{3} - 3\sqrt{6} \\ & \quad \quad \quad \begin{array}{c} \wedge \\ 15 \end{array} \\ & \boxed{21\sqrt{3} - 3\sqrt{6}} \end{aligned}$$

$$\begin{aligned} \#26. \quad & 3\sqrt{225x} + 5\sqrt{144x} \\ & 3 \cdot 15\sqrt{x} + 5 \cdot 12\sqrt{x} \\ & 45\sqrt{x} + 60\sqrt{x} \\ & \boxed{105\sqrt{x}} \end{aligned}$$

$$\begin{aligned} \#28 \quad & (3\sqrt{y} - \sqrt{5})(2\sqrt{y} + 5\sqrt{5}) \\ & 6y + 15\sqrt{5y} - 2\sqrt{5y} - 5 \cdot 5 \\ & 6y - 25 + 13\sqrt{5y} \end{aligned}$$

$$\#30 \quad \frac{(3-\sqrt{10})(\sqrt{5}+\sqrt{2})}{(\sqrt{5}-\sqrt{2})(\sqrt{5}+\sqrt{2})}$$

$$\frac{3\sqrt{5} + 3\sqrt{2} - \sqrt{10}\sqrt{5} - \sqrt{10}\sqrt{2}}{(\sqrt{5})^2 - (\sqrt{2})^2}$$

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

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