

Multiplying Radicals

$$\begin{aligned} \textcircled{1} \quad & \sqrt{2} \cdot \sqrt{10} \\ & = \sqrt{20} \\ & \quad \begin{array}{c} \textcircled{4} \textcircled{5} \\ \wedge \quad \wedge \\ 2 \quad 2 \end{array} \\ & = \boxed{2\sqrt{5}} \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad & \sqrt{20} \cdot -5\sqrt{10} \\ & = -5\sqrt{200} = -5 \cdot 5 \cdot 2 \sqrt{2} \\ & \quad \begin{array}{c} 50 \textcircled{4} \\ \wedge \quad \wedge \\ 5 \quad 10 \quad 2 \quad 2 \\ \cancel{2} \end{array} \\ & = \boxed{-50\sqrt{2}} \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad & 5\sqrt{15v^2} \cdot 3\sqrt{15v} \\ & = 15\sqrt{225v^3} = 15 \cdot 5 \cdot 3v\sqrt{v} \\ & \quad \begin{array}{c} 15 \quad 15 \quad v^2 \textcircled{1} \\ \wedge \quad \wedge \quad \wedge \\ \cancel{3} \quad \cancel{3} \quad 3 \end{array} \\ & = \boxed{225v\sqrt{v}} \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad & \sqrt{6}(4+2\sqrt{2}) \\ & = 4\sqrt{6} + 2\sqrt{12} \\ & \quad \downarrow 4 \textcircled{3} \\ & = 4\sqrt{6} + 2 \cdot 2\sqrt{3} \\ & = \boxed{4\sqrt{6} + 4\sqrt{3}} \end{aligned}$$

$$\begin{aligned} \textcircled{5} \quad & \sqrt{6p}(\sqrt{2} + \sqrt{6p}) \\ & = \sqrt{12p} + \sqrt{36p^2} \\ & \quad \begin{array}{c} 4 \quad 3 \quad p \\ \wedge \quad \wedge \quad \wedge \end{array} \\ & = \boxed{2\sqrt{3p} + 6p} \end{aligned}$$

$$\begin{aligned} \textcircled{6} \quad & 4\sqrt{2}(5n+3\sqrt{10n}) \\ & = 20n\sqrt{2} + 12\sqrt{20n} \\ & \quad \downarrow 4 \textcircled{5} \quad \wedge \\ & = 20n\sqrt{2} + 12 \cdot 2\sqrt{5n} \\ & = \boxed{20n\sqrt{2} + 24\sqrt{5n}} \end{aligned}$$

$$\begin{aligned} \textcircled{7} \quad & -\sqrt{3n}(-2\sqrt{6n} - 4\sqrt{10n}) \\ & = 2\sqrt{18n^2} + 4\sqrt{30n^2} \\ & \quad \downarrow 2 \textcircled{9} \quad \wedge \quad \downarrow 4 \textcircled{15} \quad \wedge \\ & = 2 \cdot 3n\sqrt{2} + 4n\sqrt{30} \\ & = \boxed{6n\sqrt{2} + 4n\sqrt{30}} \end{aligned}$$