

Alg 2: Homework 31

$$\textcircled{1} \quad 17 - \sqrt{11} \xrightarrow{\text{conjugate}} \boxed{17 + \sqrt{11}}$$

$$\textcircled{2} \quad \sqrt{\frac{2}{3}} = \frac{\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{6}}{3}}$$

$$\textcircled{3} \quad \frac{1}{4 - \sqrt{3}} \cdot \left( \frac{4 + \sqrt{3}}{4 + \sqrt{3}} \right) = \frac{4 + \sqrt{3}}{16 - 3} = \boxed{\frac{4 + \sqrt{3}}{13}}$$

$$\textcircled{4} \quad \frac{2 + \sqrt{5}}{4 - \sqrt{5}} \cdot \left( \frac{4 + \sqrt{5}}{4 + \sqrt{5}} \right) = \frac{8 + 2\sqrt{5} + 4\sqrt{5} + 5}{16 - 5}$$
$$= \boxed{\frac{13 + 6\sqrt{5}}{11}}$$

$$\textcircled{5} \quad \sqrt[3]{\frac{3}{16}} = \frac{\sqrt[3]{3}}{\sqrt[3]{16}} = \frac{\sqrt[3]{3}}{\sqrt[3]{8} \sqrt[3]{2}} = \frac{\sqrt[3]{3}}{2 \sqrt[3]{2}} \left( \frac{\sqrt[3]{4}}{\sqrt[3]{4}} \right)$$
$$= \frac{\sqrt[3]{12}}{2 \sqrt[3]{8}} = \boxed{\frac{\sqrt[3]{12}}{4}}$$

$$\textcircled{6} \quad \frac{4}{3 + \sqrt{11}} \cdot \left( \frac{3 - \sqrt{11}}{3 - \sqrt{11}} \right) = \frac{4(3 - \sqrt{11})}{9 - 11}$$
$$= \frac{4(3 - \sqrt{11})}{-2} = -2(3 - \sqrt{11})$$
$$= \boxed{-6 + 2\sqrt{11}}$$

$$\textcircled{7} \quad 5\sqrt{18} \sqrt{\frac{1}{3}} = 5\sqrt{18 \cdot \frac{1}{3}} = \boxed{5\sqrt{6}}$$

$$\textcircled{8} (3-\sqrt{2})^2 = (3-\sqrt{2})(3-\sqrt{2})$$

$$= 9 - 3\sqrt{2} - 3\sqrt{2} + 2$$

$$= \boxed{11 - 6\sqrt{2}}$$

$$\textcircled{9} \left( \frac{3}{x^2} + \frac{5}{x^3} \right) x^3$$

$$\left( \frac{10}{x} + 6 \right) x^3$$

$$= \frac{3x + 5}{10x^2 + 6x^3}$$

$$= \frac{\cancel{3x} + 5}{2x^2(\cancel{5} + 3x)}$$

$$= \boxed{\frac{1}{2x^2}}$$