

$$30) 2\sqrt{8} \cdot -5\sqrt{3}$$

$$= -10\sqrt{24}$$

$$= -10\sqrt{4 \cdot 6}$$

$$= -10 \cdot 2\sqrt{6}$$

$$= \boxed{-20\sqrt{6}}$$

$$31) -4\sqrt{3} \cdot 3\sqrt{3}$$

$$= -12\sqrt{9}$$

$$= -12 \cdot 3$$

$$= \boxed{-36}$$

$$32) 3\sqrt{15}(5\sqrt{3} + 2\sqrt{10})$$

$$= 15\sqrt{45} + 6\sqrt{150}$$

$$= 15\sqrt{9 \cdot 5} + 6\sqrt{25 \cdot 6}$$

$$= 15 \cdot 3\sqrt{5} + 6 \cdot 5\sqrt{6}$$

$$= \boxed{45\sqrt{5} + 30\sqrt{6}}$$

$$33) 3\sqrt{15}(5 - 2\sqrt{5})$$

$$= 15\sqrt{15} - 6\sqrt{75}$$

$$= 15\sqrt{15} - 6\sqrt{25 \cdot 3}$$

$$= 15\sqrt{15} - 6 \cdot 5\sqrt{3}$$

$$= \boxed{15\sqrt{15} - 30\sqrt{3}}$$

$$34) 3\sqrt{15}(5 + 5\sqrt{6})$$

$$= 15\sqrt{15} + 15\sqrt{90}$$

$$= 15\sqrt{15} + 15\sqrt{9 \cdot 10}$$

$$= 15\sqrt{15} + 15 \cdot 3\sqrt{10}$$

$$= \boxed{15\sqrt{15} + 45\sqrt{10}}$$

$$35) (-\sqrt{3} + 2\sqrt{2})(-2\sqrt{3} - 2\sqrt{2})$$

$$= 2\sqrt{9} + 2\sqrt{6} - 4\sqrt{6} - 4\sqrt{4}$$

$$= 2 \cdot 3 + 2\sqrt{6} - 4\sqrt{6} - 4 \cdot 2$$

$$= 6 + -2\sqrt{6} - 8$$

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

$$36) (-\sqrt{3} + 1)(5\sqrt{3} + 5)$$

$$= -5\sqrt{9} - 5\sqrt{3} + 5\sqrt{3} + 5$$

$$= -5 \cdot 3 + 5$$

$$= -15 + 5$$

$$= \boxed{-10}$$

$$37) (5\sqrt{2} - 2\sqrt{3})(-\sqrt{5} - 5\sqrt{3})$$

$$= -5\sqrt{10} - 25\sqrt{6} + 2\sqrt{15} + 10\sqrt{9}$$

$$= -5\sqrt{10} - 25\sqrt{6} + 2\sqrt{15} + 10 \cdot 3$$

$$= \boxed{-5\sqrt{10} - 25\sqrt{6} + 2\sqrt{15} + 30}$$

$$\begin{aligned}
 38) \quad & \frac{\sqrt{6}}{\sqrt{75}} \cdot \frac{\sqrt{75}}{\sqrt{75}} \\
 & = \frac{\sqrt{450}}{\sqrt{5625}} = \frac{\sqrt{225 \cdot 2}}{75} \\
 & = \frac{15\sqrt{2}}{75} = \boxed{\frac{\sqrt{2}}{5}}
 \end{aligned}$$

$$\begin{aligned}
 39) \quad & \frac{5\sqrt{15}}{5\sqrt{20}} \cdot \frac{\sqrt{20}}{\sqrt{20}} \\
 & = \frac{5\sqrt{300}}{5\sqrt{400}} = \frac{5\sqrt{100 \cdot 3}}{5 \cdot 20} \\
 & = \frac{5 \cdot 10\sqrt{3}}{100} = \frac{50\sqrt{3}}{100} = \boxed{\frac{\sqrt{3}}{2}}
 \end{aligned}$$

$$\begin{aligned}
 40) \quad & \frac{3\sqrt{15}}{2\sqrt{20}} \cdot \frac{\sqrt{20}}{\sqrt{20}} \\
 & = \frac{3\sqrt{300}}{2\sqrt{400}} = \frac{3\sqrt{100 \cdot 3}}{2 \cdot 20} \\
 & = \frac{3 \cdot 10\sqrt{3}}{40} = \frac{30\sqrt{3}}{40} = \boxed{\frac{3\sqrt{3}}{4}}
 \end{aligned}$$

$$\begin{aligned}
 41) \quad & \frac{5}{(-1-2\sqrt{2})} \cdot \frac{(-1+2\sqrt{2})}{(-1+2\sqrt{2})} \\
 & = \frac{-5 + 10\sqrt{2}}{1 - 2\sqrt{2} + 2\sqrt{2} - 4\sqrt{4}} \\
 & = \frac{-5 + 10\sqrt{2}}{1 - 4 \cdot 2} = \frac{-5 + 10\sqrt{2}}{-1 - 8}
 \end{aligned}$$

$$= \boxed{\frac{-5 + 10\sqrt{2}}{-7}}$$



$$42) \frac{2}{(4+3\sqrt{5})} \cdot \frac{(4-3\sqrt{5})}{(4-3\sqrt{5})}$$

$$= \frac{8-6\sqrt{5}}{16-12\sqrt{5}+12\sqrt{5}-9\sqrt{25}}$$

$$= \frac{8-6\sqrt{5}}{16-9 \cdot 5}$$

$$= \frac{8-6\sqrt{5}}{16-45} = \boxed{\frac{8-6\sqrt{5}}{-29}}$$

$$43) \frac{2}{(3\sqrt{5}-2\sqrt{3})} \cdot \frac{(3\sqrt{5}+2\sqrt{3})}{(3\sqrt{5}+2\sqrt{3})}$$

$$= \frac{6\sqrt{5}+4\sqrt{3}}{9\sqrt{25}+6\sqrt{15}-6\sqrt{15}-4\sqrt{9}}$$

$$= \frac{6\sqrt{5}+4\sqrt{3}}{9 \cdot 5 - 4 \cdot 3} = \frac{6\sqrt{5}+4\sqrt{3}}{45-12}$$

$$= \boxed{\frac{6\sqrt{5}+4\sqrt{3}}{33}}$$

$$44) \frac{4}{5\sqrt{2}-4\sqrt{3}} \cdot \frac{(5\sqrt{2}+4\sqrt{3})}{(5\sqrt{2}+4\sqrt{3})}$$

$$= \frac{20\sqrt{2}+16\sqrt{3}}{25\sqrt{4}+20\sqrt{6}-20\sqrt{6}-16\sqrt{9}}$$

$$= \frac{20\sqrt{2}+16\sqrt{3}}{25 \cdot 2 - 16 \cdot 3}$$

$$= \frac{20\sqrt{2}+16\sqrt{3}}{50-48} = \boxed{\frac{20\sqrt{2}+16\sqrt{3}}{2}} = \frac{10\sqrt{2}+8\sqrt{3}}{1} = \boxed{10\sqrt{2}+8\sqrt{3}}$$