

## Rationalizing

Simplify.

$$1) \frac{\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \boxed{\frac{\sqrt{6}}{3}}$$

$$2) \frac{4}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{\frac{4\sqrt{5}}{5}}$$

$$3) \frac{\sqrt{12}}{3\sqrt{20}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{60}}{3\sqrt{100}} = \frac{\sqrt{60}}{30} = \frac{2\sqrt{15}}{30} = \boxed{\frac{\sqrt{15}}{15}}$$

$$4) \frac{2\sqrt{5}}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{10}}{\sqrt{4}} = \frac{2\sqrt{10}}{2} = \boxed{\sqrt{10}}$$

$$5) -\frac{1}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \boxed{-\frac{\sqrt{5}}{5}}$$

$$6) \frac{2\sqrt{4}}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{2\sqrt{40}}{10} = \frac{\sqrt{40}}{5} = \boxed{\frac{2\sqrt{10}}{5}}$$

$$7) \frac{5-\sqrt{3}}{\sqrt{12}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{3}-3}{\sqrt{36}} = \boxed{\frac{5\sqrt{3}-3}{6}}$$

$$8) \frac{\sqrt{3}+4}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \boxed{\frac{\sqrt{6}+4\sqrt{2}}{2}}$$

$$9) \frac{-3-5\sqrt{3}}{2\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{-3\sqrt{3}-5\sqrt{9}}{2\sqrt{9}}$$

$$\frac{-3\sqrt{3}-15}{6} = \boxed{\frac{-\sqrt{3}-5}{2}}$$

$$10) \frac{3-4\sqrt{2}}{2\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{3\sqrt{10}-4\sqrt{20}}{2\sqrt{100}}$$

$$\boxed{\frac{3\sqrt{10}-8\sqrt{5}}{20}}$$

$$11) \frac{5}{3-\sqrt{5}} \cdot \frac{3+\sqrt{5}}{3+\sqrt{5}} = \frac{15+5\sqrt{5}}{9+3\sqrt{5}-3\sqrt{5}-5}$$

$$\boxed{\frac{15+5\sqrt{5}}{4}}$$

$$12) \frac{4}{-2+\sqrt{3}} \cdot \frac{-2-\sqrt{3}}{-2-\sqrt{3}} = \frac{-8-4\sqrt{3}}{4+2\sqrt{3}-2\sqrt{3}-3}$$

$$\frac{-8-4\sqrt{3}}{1} = \boxed{-8-4\sqrt{3}}$$

$$13) \frac{2}{-4+4\sqrt{3}} \cdot \frac{-4-4\sqrt{3}}{-4-4\sqrt{3}} = \frac{-8-8\sqrt{3}}{16+16\sqrt{3}-16\sqrt{3}-48}$$

$$\frac{-8-8\sqrt{3}}{-32} = \boxed{\frac{1+\sqrt{3}}{4}}$$

$$14) \frac{2}{-5+\sqrt{5}} \cdot \frac{-5-\sqrt{5}}{-5-\sqrt{5}} = \frac{-10-2\sqrt{5}}{25+5\sqrt{5}-5\sqrt{5}-5}$$

$$\frac{-10-2\sqrt{5}}{20} = \boxed{\frac{-5-\sqrt{5}}{10}}$$

$$15) \frac{\sqrt{5}-\sqrt{3}}{\sqrt{5}-4} \cdot \frac{-\sqrt{5}-4}{-\sqrt{5}-4}$$

$$= \frac{-5-4\sqrt{5}+\sqrt{5}+4\sqrt{3}}{-5-4\sqrt{5}+4\sqrt{3}+16}$$

$$= \boxed{\frac{-5-4\sqrt{5}+\sqrt{5}+4\sqrt{3}}{11}}$$

$$16) \frac{3-\sqrt{2}}{2-\sqrt{5}} \cdot \frac{2+\sqrt{5}}{2+\sqrt{5}} = \frac{6+3\sqrt{5}-2\sqrt{2}-\sqrt{10}}{4+2\sqrt{5}-2\sqrt{5}-5}$$

$$\frac{6+3\sqrt{5}-2\sqrt{2}-10}{-1} = \boxed{-6-3\sqrt{5}+2\sqrt{2}+10}$$

$$17) \frac{2+\sqrt{3}}{3-\sqrt{5}} \cdot \frac{3+\sqrt{5}}{3+\sqrt{5}} = \frac{6+2\sqrt{5}+3\sqrt{3}+\sqrt{15}}{9+3\sqrt{5}-3\sqrt{5}-5}$$

$$\boxed{\frac{6+2\sqrt{5}+3\sqrt{3}+\sqrt{15}}{4}}$$

$$18) \frac{3+\sqrt{5}}{4-\sqrt{3}} \cdot \frac{4+\sqrt{3}}{4+\sqrt{3}} = \frac{12+3\sqrt{3}+4\sqrt{5}+\sqrt{15}}{16+4\sqrt{3}-4\sqrt{3}-3}$$

$$\boxed{\frac{12+3\sqrt{3}+4\sqrt{5}+\sqrt{15}}{13}}$$

① (5m+2)(m-10)

-2- ② (3n-5)(n+3)