

Operations with Radicals

Simplify.

$$1) \frac{3\sqrt{27} + 2\sqrt{3}}{11\sqrt{3}}$$

$$2) \frac{-3\sqrt{20} - \sqrt{5}}{-7\sqrt{5}}$$

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

$$4) \frac{3\sqrt{24} - 2\sqrt{6}}{4\sqrt{6}}$$

$$5) \frac{3\sqrt{6} - 3\sqrt{24}}{-3\sqrt{6}}$$

$$6) \frac{3\sqrt{12} + 2\sqrt{3}}{8\sqrt{3}}$$

$$7) \frac{2\sqrt{24} + 2\sqrt{6} + 2\sqrt{6}}{8\sqrt{6}}$$

$$8) \frac{3\sqrt{45} - 3\sqrt{5} - \sqrt{5}}{5\sqrt{5}}$$

$$9) \frac{2\sqrt{8} - 3\sqrt{6} - 2\sqrt{18}}{-2\sqrt{2} - 3\sqrt{6}}$$

$$10) \frac{3\sqrt{18} + 3\sqrt{8} - \sqrt{3}}{15\sqrt{2} - \sqrt{3}}$$

$$11) \frac{4\sqrt{10} \cdot \sqrt{2}}{8\sqrt{5}}$$

$$12) \frac{\sqrt{6} \cdot 2\sqrt{6}}{12}$$

$$13) \frac{-\sqrt{15} \cdot 2\sqrt{3}}{-6\sqrt{5}}$$

$$14) \frac{-3\sqrt{12} \cdot \sqrt{12}}{-36}$$

$$15) \frac{-2\sqrt{10}(\sqrt{10} + \sqrt{3})}{-20 - 2\sqrt{30}}$$

$$16) \frac{\sqrt{6}(3 - 4\sqrt{3})}{3\sqrt{6} - 12\sqrt{2}}$$

$$17) \frac{3\sqrt{15}(2 + 3\sqrt{6})}{6\sqrt{15} + 27\sqrt{10}}$$

$$18) \frac{(\sqrt{3} - 2)(-5\sqrt{3} - 2)}{-11 + 8\sqrt{3}}$$

$$19) \frac{(-4 - 4\sqrt{5})(-4 + \sqrt{5})}{-4 + 12\sqrt{5}}$$

$$20) \frac{(\sqrt{3} + 4\sqrt{2})(\sqrt{3} + \sqrt{5})}{3 + \sqrt{15} + 4\sqrt{6} + 4\sqrt{10}}$$