

Simplifying, Adding, & Subtracting Radicals

Simplify.

$$1) 8\sqrt{200p^{10}q^{15}r^{13}}$$

$$80p^5q^7r^6\sqrt{2qr}$$

$$2) -2\sqrt{27x^{11}y^8z^{16}}$$

$$-6x^5y^4z^8\sqrt{3x}$$

$$3) 6\sqrt{8x^9y^{17}z^{12}}$$

$$12x^4y^8z^6\sqrt{2xyz}$$

$$4) -7\sqrt{8x^5y^7z^{11}}$$

$$-14x^2y^3z^5\sqrt{2xyz}$$

$$5) -8\sqrt[3]{-216m^6n^9p^{10}}$$

$$48m^2n^3p^3\sqrt[3]{p}$$

$$6) -4\sqrt[3]{250a^7b^{12}c^{14}}$$

$$-20a^2b^4c^4\sqrt[3]{2ac^2}$$

$$7) -2\sqrt{3} - 2\sqrt{3} - 2\sqrt{3} + 3\sqrt{3}$$

$$-3\sqrt{3}$$

$$8) 3\sqrt{2} - 3\sqrt{3} + 3\sqrt{5} - 2\sqrt{2}$$

$$\sqrt{2} - 3\sqrt{3} + 3\sqrt{5}$$

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

$$-7\sqrt{2} + 2\sqrt{3}$$

$$10) 3\sqrt{3} + 3\sqrt{54} - 3\sqrt{3} - \sqrt{3}$$

$$9\sqrt{6} - \sqrt{3}$$

$$11) -3\sqrt{45} + 2\sqrt{5} - 2\sqrt{5} - 3\sqrt{2}$$

$$-9\sqrt{5} - 3\sqrt{2}$$

$$12) -\sqrt{5} + 3\sqrt{24} - 3\sqrt{8} - \sqrt{5}$$

$$-2\sqrt{5} + 6\sqrt{6} - 6\sqrt{2}$$