perfect squares: 1 4 9 16 25 36 49 64 81 100 121 144 169 196 225 256 289 324 361 400
perfect cubes: 1 8 27 64 125 216 343 512 729 1000

Principles of Algebra Name/Date Clee / Today

ALL PROBLEMS CAN BE COMPLETED ON THIS WORKSHEET

WS 14C.1 – Multiplying Radicals

#1-10, Simplify each radical expression.

1. $\sqrt{6}\cdot\sqrt{12}$

$= \sqrt{72}$

$= \sqrt{36\cdot 2}$

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

2. $\sqrt[3]{3}\cdot\sqrt[3]{18}$

$= \sqrt[3]{54}$

$= \sqrt[3]{27\cdot 2}$

$= \boxed{3\sqrt[3]{2}}$

3. $4\sqrt{2x}\cdot 5\sqrt{6xy^2}$

$= 20\sqrt{12x^2y^2}$

$= 20\sqrt{4\cdot 3\cdot x^2\cdot y^2}$

$= \boxed{40xy\sqrt{3}}$

4. $-\sqrt[3]{2m^2n^2}\cdot 2\sqrt[3]{16m^5n}$

$= -2\sqrt[3]{32m^7n^3}$

$= -2\sqrt[3]{8\cdot 4\cdot m^6\cdot m\cdot n^3}$

$= \boxed{-4m^2n\sqrt[3]{4m}}$

5. $(3\sqrt{5}+2\sqrt{10})(2\sqrt{5}+4\sqrt{10})$ FOIL (binomials)

$= 6\sqrt{25}^{F} + 12\sqrt{50}^{O} + 4\sqrt{50}^{I} + 8\sqrt{100}^{L}$

$= 30 + 16\sqrt{50} + 80$

$= 110 + 16\sqrt{25\cdot 2}$

$= \boxed{110 + 30\sqrt{2}}$

6. $(-\sqrt{7d^5})(-4\sqrt{42df^9})$ not FOIL (monomials)

$= 4\sqrt{294d^6f^9}$

$= 4\sqrt{49\cdot 6\cdot d^6\cdot f^8\cdot f}$

$= \boxed{28d^3f^4\sqrt{6f}}$

7. $(3\sqrt{x}-4\sqrt{5})^2$

$= (3\sqrt{x}-4\sqrt{5})(3\sqrt{x}-4\sqrt{5})$ FOIL (binomials)

$= 9\sqrt{x^2}^{F} - 12\sqrt{5x}^{O} - 12\sqrt{5x}^{I} + 16\sqrt{25}^{L}$

$= \boxed{9x - 24\sqrt{5x} + 80}$

8. $5\sqrt{2ab^6}\cdot 2\sqrt{2a^3b}$

$= 10\sqrt{4a^4b^7}$

$= 10\sqrt{4\cdot a^4\cdot b^6\cdot b}$

$= \boxed{20a^2b^3\sqrt{b}}$

9. $\sqrt{8}(\sqrt{24}-3\sqrt{8})$ $24 = 8\cdot 3$

$= \sqrt{64\cdot 3} - 3\sqrt{64}$

$= \boxed{8\sqrt{3} - 24}$

10. $-\sqrt[3]{729a^5b^5}\cdot 3\sqrt[3]{64a^7b^6}$

$= -9\sqrt[3]{a^5b^5}\cdot 12\sqrt[3]{a^7\cdot b^6}$

$= -108\sqrt[3]{a^{12}\cdot b^{11}}$

$= -108\sqrt[3]{a^{12}\cdot b^9\cdot b^2} = \boxed{-108a^4b^3\sqrt[3]{b^2}}$