College Math

Name key

Working with Radicals - NOTES

★ WHEN ADDING AND SUBTRACTING, ONLY COMBINE LIKE-RADICALS.

Date _____

Simplify.

1) $-3\sqrt{6} - 2\sqrt{6}$

$-5\sqrt{6}$

2) $-3\sqrt{3} - 1\sqrt{3}$

$-4\sqrt{3}$

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

$-3\sqrt{2} + -1\sqrt{5}$

4) $2\sqrt{3} + 3\sqrt{3} + 2\sqrt{3}$

$7\sqrt{3}$

5) $-1\sqrt{6} + 2\sqrt{6} + 3\sqrt{5} - 1\sqrt{5}$

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

6) $-2\sqrt{6} - 3\sqrt{6} + 2\sqrt{5} - 3\sqrt{2}$

$-5\sqrt{6} + 2\sqrt{5} - 3\sqrt{2}$

7) $-3\sqrt{12} - \sqrt{27}$

SIMPLIFY FIRST!

$-3\sqrt{4 \cdot 3} - \sqrt{9 \cdot 3}$

$-3 \cdot 2\sqrt{3} - 3\sqrt{3}$

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

$-9\sqrt{3}$

8) $-3\sqrt{54} - 3\sqrt{6}$

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

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

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

$-12\sqrt{6}$

9) $-3\sqrt{15} \cdot -\sqrt{25}$

$-3\sqrt{15} * -5$

$15\sqrt{15}$

MULTIPLY OUTSIDE NUMBERS TOGETHER, AND INSIDE NUMBERS TOGETHER.

10) $5\sqrt{6} \cdot 3\sqrt{15}$

$15\sqrt{90}$ ← SIMPLIFY!

$15\sqrt{9 \cdot 10}$

$15 \cdot 3\sqrt{10}$

$45\sqrt{10}$

11) $2\sqrt[3]{9} \cdot 3\sqrt[3]{9}$

$6\sqrt[3]{81}$

$6\sqrt[3]{27 \cdot 3}$

$6 \cdot 3\sqrt[3]{3}$

$18\sqrt[3]{3}$

12) $5\sqrt[5]{3} \cdot -4\sqrt[5]{3}$

$-20\sqrt[5]{9}$

13) $-2\sqrt{5}(5 - 3\sqrt{10})$

$-10\sqrt{5} + 6\sqrt{50}$

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

$-10\sqrt{5} + 6 \cdot 5\sqrt{2}$

$-10\sqrt{5} + 30\sqrt{2}$

DISTRIBUTE AND SIMPLIFY

14) $4\sqrt{15}(-2\sqrt{3} + 3)$

$-8\sqrt{45} + 12\sqrt{15}$

$-8\sqrt{9 \cdot 5} + 12\sqrt{15}$

$-8 \cdot 3\sqrt{5} + 12\sqrt{15}$

$-24\sqrt{5} + 12\sqrt{15}$

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

$9\sqrt{20} + -9\sqrt{30}$

$9\sqrt{4 \cdot 5} + -9\sqrt{30}$

$9 \cdot 2\sqrt{5} + -9\sqrt{30}$

$18\sqrt{5} + -9\sqrt{30}$

16) $(-2\sqrt{3} - 5)(2\sqrt{3} + 3)$

$-4\sqrt{9} - 6\sqrt{3} - 10\sqrt{3} - 15$

$-4 \cdot 3 - 16\sqrt{3} - 15$

$-12 - 16\sqrt{3} - 15$

$-27 - 16\sqrt{3}$

17) $(3\sqrt{5} - 2\sqrt{3})^2$

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

$9\sqrt{25} - 6\sqrt{15} - 6\sqrt{15} + 4\sqrt{9}$

$9 \cdot 5 - 12\sqrt{15} + 4 \cdot 3$

$45 - 12\sqrt{15} + 12$

$57 - 12\sqrt{15}$

18) $(-5\sqrt{5} + 4)(4\sqrt{5} + 3)$

$-20\sqrt{25} - 15\sqrt{5} + 16\sqrt{5} + 12$

$-20 \cdot 5 + \sqrt{5} + 12$

$-100 + \sqrt{5} + 12$

$-88 + \sqrt{5}$