KEY

Unit 9 Day 4 Notes on Adding and Subtracting Radicals

Warm-up: Multiply/Divide Radicals

1) $\sqrt{5} \bullet \sqrt{15}$

$\sqrt{75}$

$\sqrt{25}\sqrt{3}$

$\boxed{5\sqrt{3}}$

2) $\sqrt{x^5} \bullet \sqrt{x^3}$

$\sqrt{x^8}$

$\boxed{x^4}$

3) $3\sqrt{14} \bullet 2\sqrt{14}$

$6\sqrt{14^2}$

$6 \cdot 14$

$\boxed{84}$

4) $-4\sqrt{7} \bullet 5\sqrt{6}$

$\boxed{-20\sqrt{42}}$

5) $-\sqrt{3}\left(2\sqrt{12}\right)$

$-2\sqrt{36}$

$-2 \cdot 6$

$\boxed{-12}$

6) $\frac{27}{\sqrt{3}} \frac{\cdot\sqrt{3}}{\cdot\sqrt{3}} = \frac{27\sqrt{3}}{3} = \boxed{9\sqrt{3}}$

Quick Review: Simplify the following:

a) $3x + 4x =$ $\boxed{7x}$

b) $10x^2 - 4x^2 + 2x^2 =$ $\boxed{8x^2}$

c) $9x - 4y + 3x =$ $\boxed{12x - 4y}$

Now let's add and subtract radicals…

a) $3\sqrt{2} + 4\sqrt{2} =$ $\boxed{7\sqrt{2}}$

b) $\sqrt{7} - 8\sqrt{7} =$ $\boxed{-7\sqrt{7}}$

c) $\boxed{5\sqrt{6} + 8\sqrt{3}} =$ can't combine

When adding/subtracting radicals, the radicals must have* like radicals *

(same number under the radical)

1) $3\sqrt{7} + 2\sqrt{3} + 8\sqrt{7}$

$\boxed{11\sqrt{7} + 2\sqrt{3}}$

2) $3\sqrt{4} + 7\sqrt{2}$

$3 \cdot 2$

$\boxed{6 + 7\sqrt{2}}$

3) $2\sqrt{6} - 5\sqrt{54}$

$\sqrt{9}\sqrt{6}$

$2\sqrt{6} - 15\sqrt{6}$

$\boxed{-13\sqrt{6}}$

Partner Practice:

4) $3\sqrt{3} - \sqrt{27}$

$\sqrt{9}\sqrt{3}$

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

$\boxed{0}$

5) $-2\sqrt{20} + 2\sqrt{18} - 2\sqrt{5}$

$\sqrt{4}\sqrt{5}$ $\sqrt{9}\sqrt{2}$

$-4\sqrt{5} + 6\sqrt{2} - 2\sqrt{5}$

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

6) $3\sqrt{27} - 5\sqrt{50} + \sqrt{48} + 2\sqrt{128}$

$\sqrt{9}\sqrt{3}$ $\sqrt{25}\sqrt{2}$ $\sqrt{16}\sqrt{3}$ $\sqrt{64}\sqrt{2}$

$9\sqrt{3} - 25\sqrt{2} + 4\sqrt{3} + 16\sqrt{2}$

$\boxed{13\sqrt{3} - 9\sqrt{2}}$

Quick Review Part II: Simplify the following:

a) $3(2x + 1) =$

$\boxed{6x + 3}$

b) $2x(4x - 10)$

$\boxed{8x^2 - 20x}$

c) $(x + 2)(x - 3)$

FOIL

$x^2 \underbrace{-3x + 2x}_{} - 6$

$\boxed{x^2 - x - 6}$

Are you up for the challenge?!?

a) $\sqrt{6}\,(7\sqrt{3} + 2\sqrt{6})$

$\sqrt{9}\sqrt{2}$

$7\sqrt{18} + 2\sqrt{36}$

$7 \cdot 3 \cdot \sqrt{2}$ $2 \cdot 6$

$\boxed{21\sqrt{2} + 12}$

c) $(8\sqrt{3} + \sqrt{2})(\sqrt{3} + 5\sqrt{2})$

$8\sqrt{9} + 40\sqrt{6} + \sqrt{6} + 5\sqrt{4}$

$8 \cdot 3$ $5 \cdot 2$

$24 + 41\sqrt{6} + 10$

$\boxed{34 + 41\sqrt{6}}$