Pre-Calculus 11 Radicals

Lesson 3 Multiplying Radicals

Products of radicals may be expanded using the distributive property and the multiplication property of radicals.

Radicals should always be simplified

Examples: Multiply

1. $(3\sqrt{2})(4\sqrt{5})$

mult the numbers in front

mult the numbers under the radical

$12\sqrt{10}$

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

use distributive property
ie mult $3\sqrt{10}$ by each term in the brackets

$3\sqrt{20} + 6\sqrt{50}$

$3\sqrt{4\cdot5} + 6\sqrt{25\cdot2}$

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

$6\sqrt{5} + 30\sqrt{2}$

3. $(2\sqrt{5}+4\sqrt{2})(3\sqrt{2}-\sqrt{5})$

FOIL

$6\sqrt{10} - 2\sqrt{25} + 12\sqrt{4} - 4\sqrt{10}$

$6\sqrt{10} - 2(5) + 12(2) - 4\sqrt{10}$

$6\sqrt{10} - 10 + 24 - 4\sqrt{10}$

$14 + 2\sqrt{10}$

$\sqrt{5}\cdot\sqrt{5} = 5$

$\sqrt{2}\cdot\sqrt{2} = 2$

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* 4. $(\sqrt{5}-\sqrt{2})^2$

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

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

$7-2\sqrt{10}$

Identify the values of the variables for which each expression is defined, then expand and simplify.

5. $(2\sqrt{a}+7)(5\sqrt{a}-3)$

$a \geq 0$

$10a-6\sqrt{a}+35\sqrt{a}-21$

$10a+29\sqrt{a}-21$

conjugates

6. $(3\sqrt{x}+\sqrt{y})(3\sqrt{x}-\sqrt{y})-(\sqrt{x}+5\sqrt{y})^2$

$(\sqrt{x}+5\sqrt{y})(\sqrt{x}+5\sqrt{y})$

$9x-3\sqrt{xy}+3\sqrt{xy}-y-(x+5\sqrt{xy}+5\sqrt{xy}+25y)$

$9x-y-x-10\sqrt{xy}-25y$

$8x-26y-10\sqrt{xy}$

$x \geq 0$

$y \geq 0$

Assignment: Pg. 126 #3a,d, 4a, 5b, d, 7a, c, 8a, c, e