Sec 7-3: Binomial Radical Expressions.

Simplify each:

1. $3\sqrt{50} + 7\sqrt{24} - 8\sqrt{54} - 9\sqrt{32}$

$3\sqrt{25\cdot 2} + 7\sqrt{4\cdot 6} - 8\sqrt{9\cdot 6} - 9\sqrt{16\cdot 2}$

$3\cdot 5\sqrt{2} + 7\cdot 2\sqrt{6} - 8\cdot 3\sqrt{6} - 9\cdot 4\sqrt{2}$

$15\sqrt{2} + 14\sqrt{6} - 24\sqrt{6} - 36\sqrt{2} = -21\sqrt{2} - 10\sqrt{6}$

2. $4\sqrt{7}(5\sqrt{11} - 3\sqrt{7})$

$20\sqrt{77} - 12\cdot 7$

$= 20\sqrt{77} - 84$

3. Simplify.

$5\sqrt{2}(9\sqrt{2} - 6\sqrt{10})$

$45\cdot 2 - 30\sqrt{10}$

$90 - 30\sqrt{10}$

Multiplying 2 binomial radical expressions

$(5 + \sqrt{6})(4 - 3\sqrt{6})$

$= 20 - 11\sqrt{6}$

	5	$+\sqrt{6}$
4	20	$+4\sqrt{6}$
$-3\sqrt{6}$	$-15\sqrt{6}$	$-3\cdot 6 = -18$

Simplify each.

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

$= 5\cdot 7 - \sqrt{7\cdot 2} + 10\sqrt{7\cdot 2} - 2\cdot 2$

$= 35 - \sqrt{14} + 10\sqrt{14} - 4 = 31 + 9\sqrt{14}$

2. $(10 + 7\sqrt{3})^2 = (10 + 7\sqrt{3})(10 + 7\sqrt{3})$

$= 100 + 70\sqrt{3} + 70\sqrt{3} + 49\cdot 3$

147

$= 247 + 140\sqrt{3}$

Simplify: $(m + 5)(m - 5)$

These are called conjugates

$(a + b)(a - b) = a^2 - b^2$

$= m^2 - 5^2$

$= m^2 - 25$

Simplify:

$(7 + \sqrt{11})(7 - \sqrt{11})$

$7^2 - (\sqrt{11})^2$

$= 49 - 11$

$= 38$

Rationalize the denominator.

$$\frac{7}{8 + \sqrt{5}} \cdot \frac{8 - \sqrt{5}}{8 - \sqrt{5}} = \frac{56 - 7\sqrt{5}}{8^2 - (\sqrt{5})^2}$$

$$= \frac{56 - 7\sqrt{5}}{64 - 5}$$

$$= \frac{56 - 7\sqrt{5}}{59}$$