Multiplying Radicals

Recall - Product Property for Square Roots

if $a \geq 0$ and $b \geq 0$, then $\sqrt{ab} = \sqrt{a}\sqrt{b}$

Steps:

1. Multiply the coefficients
2. Multiply the radicands
3. Simplify last

Examples:

1. $\sqrt{2x}\left(\sqrt{2x}\right)$

$\sqrt{4x^2}$

$\sqrt{4}\sqrt{x^2}$

$\boxed{2x}$

2. $3\sqrt{6}\left(5\sqrt{2}\right)$

$15\sqrt{12}$

$15\left(\sqrt{4}\sqrt{3}\right)$

$15\left(2\sqrt{3}\right)$

$30\sqrt{3}$

3. $6\sqrt{5}\left(2\sqrt{15}\right)$

$12\sqrt{75}$

$12\left(\sqrt{25}\sqrt{3}\right)$

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

$60\sqrt{3}$

4. $\left(3\sqrt{8}\right)\left(5\sqrt{2}\right)$

$15\sqrt{16}$

$15(4)$

60

5. $\left(\sqrt{3x}\right)\left(\sqrt{6x}\right)$

$\sqrt{18x^2}$

$\sqrt{18}\ \sqrt{x^2}$

$\sqrt{9}\sqrt{2}\ \sqrt{x^2}$

$\sqrt{9}\ \sqrt{x^2}\ \sqrt{2}$

$3x\sqrt{2}$

6. $\left(5\sqrt{8}\right)\left(7\sqrt{3}\right)$

$35\sqrt{24}$

$35\left(\sqrt{4}\sqrt{6}\right)$

$35\left(2\sqrt{6}\right)$

$70\sqrt{6}$

7. $\sqrt{5}\left(2\sqrt{10} - \sqrt{50}\right)$

$\sqrt{5}\left(2\sqrt{10}\right) - \sqrt{5}\left(\sqrt{50}\right)$

$2\sqrt{50} - \sqrt{250}$

$2\left(\sqrt{25}\sqrt{2}\right) - \sqrt{25}\ \sqrt{10}$

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

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

8. $2\sqrt{6}\left(\sqrt{2} + 3\sqrt{3}\right)$

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

$2\sqrt{12} + 6\sqrt{18}$

$2\left(\sqrt{4}\sqrt{3}\right) + 6\left(\sqrt{9}\sqrt{2}\right)$

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

$\boxed{4\sqrt{3} + 18\sqrt{2}}$

HOMEWORK

Worksheet - Multiplying Radicals