Learning Goal(s):

MCR 3UI 3.4 Operations with Radicals Date: ________________________

Recall: When working with radicals all answers must be in lowest terms.
Look for factors of the radicand that are perfect squares.

Ex.1 Simplify

a) $\sqrt{50}$

b) $5\sqrt{45}$

Ex.2 Compare

$4\sqrt{5}$ and $3\sqrt{10}$

Note: Many rules are similar to algebra:

Ex.3 Simplify

a) $\sqrt{6}\times\sqrt{3}$

b) $\left(-2\sqrt{7}\right)\left(3\sqrt{7}\right)$

Ex.4 Simplify

a) $\sqrt{2}+\sqrt{2}+\sqrt{2}$ $\qquad x + x + x$

b) $2\sqrt{3}+5\sqrt{3}$ $\qquad 2x + 5x$

c) $2\sqrt{3}+3\sqrt{7}$ $\qquad 2x + 3y$

Summarizing some rules:

$\sqrt{a}+\sqrt{a}$ $\qquad \sqrt{a}\times\sqrt{a}$ $\qquad \sqrt{\dfrac{a}{b}}$ $\qquad \sqrt{a}\times\sqrt{b}$

Ex.5 Simplify

a) $3\left(4-\sqrt{6}\right)$

b) $\left(2-3\sqrt{5}\right)\left(6+\sqrt{5}\right)$

c) $\sqrt{\dfrac{2}{9}}$

Ex.5 (cont'd) Simplify

d) $\sqrt{50}+\sqrt{27}-\sqrt{72}+2\sqrt{12}$

Note: The textbook gives answers with the denominator rationalized.
This means that there is not a radical sign in the denominator.
In order to accomplish this, just multiply by an equivalent of 1.

Ex.6 Simplify

a) $\dfrac{\sqrt{7}}{\sqrt{3}}$

$$=\frac{\sqrt{7}}{\sqrt{3}}\times\frac{\sqrt{3}}{\sqrt{3}}$$

$$=\frac{\sqrt{21}}{3}$$

You try:

b) $\dfrac{2\sqrt{3}}{\sqrt{20}}$

c) $\dfrac{3\sqrt{2}}{2\sqrt{27}}$

d) $\dfrac{\sqrt{6}}{2\sqrt{18}}$

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