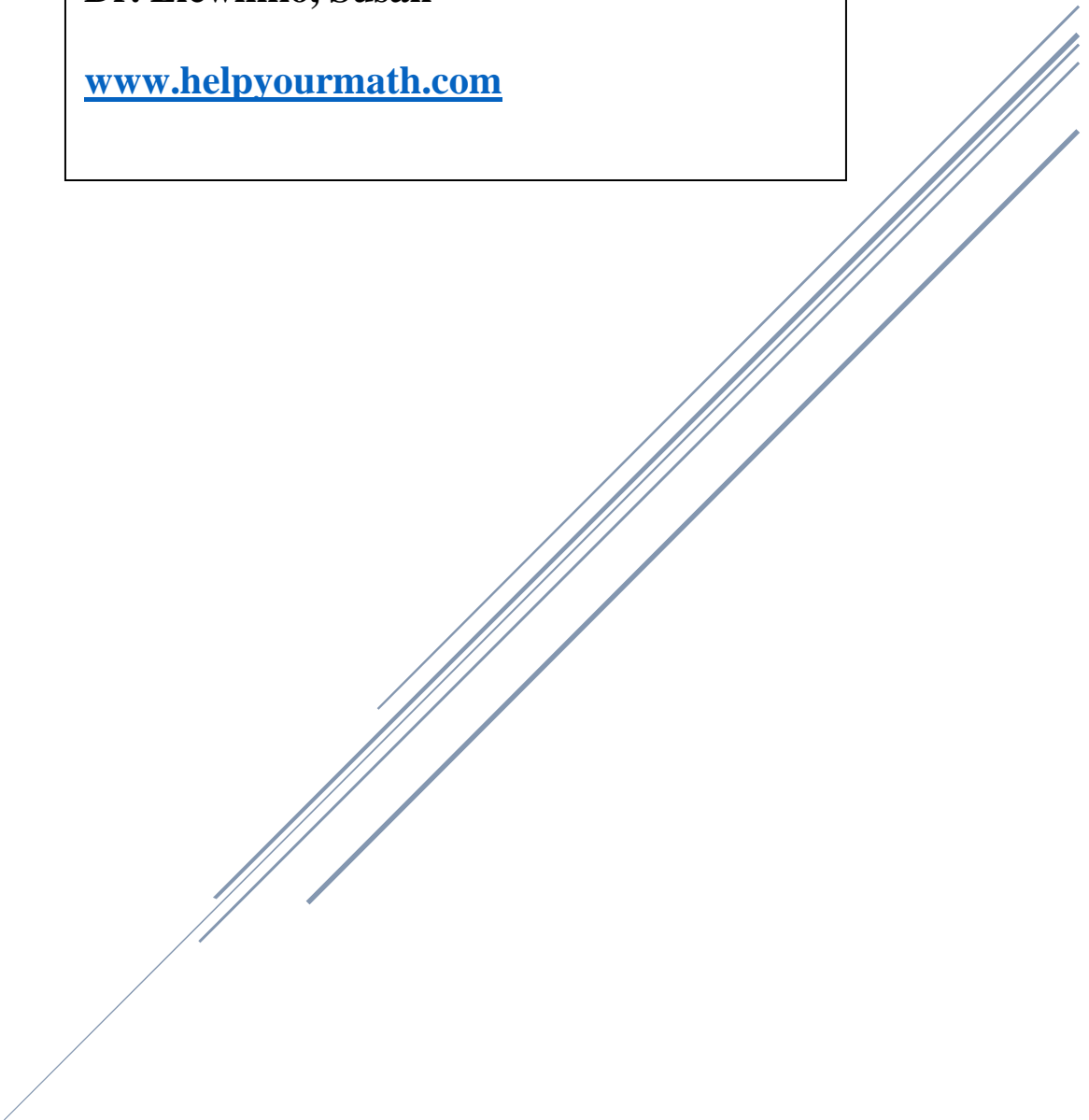


Chapter 3 Notes

Multiplying and Dividing Radicals

Dr. Licwinko, Susan

www.helpyourmath.com



Sections and videos:

Section 3.1 playlist:

<https://www.youtube.com/playlist?list=PLDP6hC4Qvja1Tlu1aqif9htmRzTHFMo60>

Section 3.2 playlist:

<https://www.youtube.com/playlist?list=PLDP6hC4Qvja3ajWXEC7Rt9asq2CT1YFSv>

Sections 3.3 and 3.4 playlist:

https://www.youtube.com/playlist?list=PLDP6hC4Qvja3e9wNV_-tnc2OwBcEir-PO

Sections 3.5 and 3.6 playlist:

<https://www.youtube.com/playlist?list=PLDP6hC4Qvja2zQscUkhtd4AXBWliLAGc7>

Section 3.7 playlist:

<https://www.youtube.com/playlist?list=PLDP6hC4Qvja1gTULGy-VCOesrzhwNa01A>

Sections 3.5 and 3.6. Multiplication and Division of Radical Expressions

How do we multiply radical expressions?

Assume all variables represent nonnegative real numbers.

1. Multiply.

a) $\sqrt{2} \cdot \sqrt{10}$

b) $\sqrt{20} \cdot \sqrt{54}$

c) $\sqrt{3}(\sqrt{15} - \sqrt{3})$

d) $\sqrt{5a^3b^2} \cdot \sqrt{20a^3b^3}$

e) $(2\sqrt[3]{3}) \cdot (4\sqrt[3]{9})$

f) $\sqrt[4]{81} \cdot \sqrt[4]{32}$

Assume all variables represent nonnegative real numbers.

2. Multiply and simplify.

a) $(8\sqrt{7} - \sqrt{5})(\sqrt{7} + 3\sqrt{5})$

b) $(\sqrt{x} - 4)^2$

c) $\sqrt[3]{2}(4\sqrt[3]{20} - 3\sqrt[3]{4})$

d) $(\sqrt{w} - 2)(\sqrt{w} - 9)$

e) $(\sqrt{6} - 2\sqrt{3})^2$

f) $(\sqrt{y+2} - 7)(\sqrt{y+2} + 7)$

g) $(\sqrt{3} - 2\sqrt{5})^2$

h) $(\sqrt{3} - \sqrt{x})(\sqrt{3} + \sqrt{x})$

i) $(\sqrt{x-1} + 5)^2$

When is a radical expression involving fractions completely simplified?

Assume all variables represent positive real numbers.

3. Simplify using the division property of radicals.

a) $\sqrt{\frac{64x^6}{y^2}}$

b) $\sqrt{\frac{121t^{14}}{36k^8}}$

c) $\sqrt[3]{\frac{54x^7}{x^2y^6}}$

4. Rationalize the denominator with one term.

a) $\frac{1}{\sqrt{3}}$

b) $\sqrt{\frac{6}{5}}$

c) $\frac{2}{\sqrt{7}}$

d) $\frac{1}{\sqrt[3]{5}}$

e) $\frac{2}{\sqrt{12}}$

f) $\sqrt{\frac{8}{54}}$

5. Rationalize the denominator with one term.

a) $\frac{4\sqrt{3}}{\sqrt{50x}}$

b) $\frac{9}{\sqrt{3a}}$

c) $\frac{7}{\sqrt[3]{9x}}$

d) $\sqrt[4]{\frac{1}{27x}}$

6. Rationalize the denominator with two terms.

a) $\frac{2}{\sqrt{2}-3}$

b) $\frac{\sqrt{2}}{\sqrt{2}-\sqrt{3}}$

$$\text{c) } \frac{-\sqrt{5}}{\sqrt{7} + \sqrt{6}}$$

$$\text{d) } \frac{-\sqrt{c}}{\sqrt{c} + 3}$$

$$\text{e) } \frac{\sqrt{5}}{2\sqrt{5} - 7}$$

$$\text{f) } \frac{\sqrt{2}}{\sqrt{3} - \sqrt{10}}$$

$$\text{g) } \frac{\sqrt{5} - 2}{\sqrt{5} + 2}$$

$$\text{h) } \frac{\sqrt{17} + 3}{\sqrt{17} - 3}$$

$$\text{i) } \frac{2\sqrt{3} - \sqrt{7}}{5\sqrt{3} + \sqrt{7}}$$