Today's Plan:

Learning Target (standard): I will divide radical expressions by rationalizing the denominator and using the conjugate.

Students will: Complete practice problems over previous concepts at the boards, put up homework problems on the board and make necessary corrections to their own work, take notes over new material and complete practice problems over new concepts.

Teacher will: Provide practice problems over previous concepts, check homework problems for accuracy and provide students feedback, describe and provide examples of new concepts and assign students assessment problems over new concepts.

Assessment: Board work, homework check and homework assignment

Differentiation: Students will work at the board, go over and correct homework at their seats, actively engage in lecture over new concepts, practice new concepts with the aid of other students and the teacher and complete homework assignment.

p.235 #48-80 (by 4)

$48)\,6$

$52)\,5x^3y^2\sqrt{2y}$

$56)\,2ab\sqrt[4]{27a^3b^3}$

$60)\,y-\sqrt{5y}$

$64)\,2x+8\sqrt{2x}+16$

$68)\,2ab^2\sqrt[3]{36ab^2}$

$72)\,y-4$

$76)\,a-5\sqrt{a}+6$

$80)\,6x-\sqrt{xy}-y$

Simplify.

$$5a\sqrt{3a^3b}+2a^2\sqrt{27ab}-4\sqrt{75a^5b}$$

27 → 9, 3; 9 → 3, 3

75 → 25, 3; 25 → 5, 5

$=5a\sqrt{3a\cdot a\,ab}+2a^2\sqrt{3\cdot3\,3ab}-4\sqrt{3\,5\cdot5\,aa\,aa\,ab}$

$=5a^2\sqrt[2]{3ab}+6a^2\sqrt[2]{3ab}-20a^2\sqrt[2]{3ab}$

$=-9a^2\sqrt{3ab}$

Simplify:

$$\sqrt{x^2y^5}\sqrt{xy}=\sqrt{x\cdot x\,x\,yy\,yy\,yy}$$

$=xy^3\sqrt{x}$

Simplify:

$$\sqrt[4]{12ab^3}\,\sqrt[4]{4a^5b^2}$$

$12 \to 4\ 3$, $4 \to 2\ 2$; $4 \to 2\ 2$

$$=\sqrt[4]{2\cdot2\cdot2\cdot2\,3\,aaaaaa\,bbbbb}$$

$$=2ab\sqrt[4]{3a^2b}$$

Simplify:

$$\left(4\sqrt{5}+2\right)^2=(4\sqrt{5}+2)(4\sqrt{5}+2)$$

$$=16\sqrt{5\cdot5}+8\sqrt{5}+8\sqrt{5}+4$$

$$=80+16\sqrt{5}+4$$

$$=84+16\sqrt{5}$$

Simplify:

$$2\sqrt{14xy}\bullet 4\sqrt{7x^2y}\bullet 3\sqrt{8xy^2}$$

14: 7 2

8: 4 2, 4: 2 2

7

$24\sqrt{2\cdot 2\, 2\cdot 2\, 7\cdot 7\, x\cdot x\, x\cdot x\, y\cdot y\, y\cdot y}$

$= 24\cdot 2\cdot 2\cdot 7\cdot x\cdot x\cdot y\cdot y$

$= 672x^2y^2$

Simplify:

$$\left(2\sqrt{3x}-\sqrt{y}\right)\left(2\sqrt{3x}+\sqrt{y}\right)$$

$= 4\sqrt{3\cdot 3\, x\cdot x} + 2\sqrt{3xy} - 2\sqrt{3xy} - \sqrt{y\cdot y}$

$= 12x - y$

Dividing Radicals:

- in order to divide radicals, the roots must match
- write as one radical and simplify

$$\frac{\sqrt[n]{a}}{\sqrt[n]{b}} = \sqrt[n]{\frac{a}{b}}$$

$$\frac{\sqrt{32x^2}}{\sqrt{2x}} = \sqrt{\frac{32x^2}{2x}}$$

$$= \sqrt{16x}$$

$$= 4\sqrt{x}$$

$$\cancel{\frac{\sqrt{7}}{\sqrt{5}}}$$

Simplify:

$$\frac{\sqrt{42a^3b^5}}{\sqrt{14a^2b}} = \sqrt{\frac{{}^{3}\cancel{42}a^3b^5}{{}_{1}\cancel{14}a^2b}}$$

$$= \sqrt{3ab^4}$$

$$= \sqrt{3 \cdot a \cdot bbbb}$$

$$= b^2\sqrt{3a}$$

Dividing Radicals:

* rationalize the denominator *

- in order to divide radicals, the roots must match
- separate the fraction and rationalize the denominator and simplify

– no root can be left in a denominator

$$\sqrt[n]{\frac{a}{b}} = \frac{\sqrt[n]{a}}{\sqrt[n]{b}}$$

$$\sqrt{\frac{2x}{5y}} = \frac{\sqrt{2x}}{\sqrt{5y}} \cdot \frac{\sqrt{5y}}{\sqrt{5y}}$$

$$= \frac{\sqrt{2 \cdot 5x \cdot y}}{\sqrt{5 \cdot 5 y \cdot y}} = \frac{\sqrt{10xy}}{5y}$$

Simplify:

$$\frac{2}{\sqrt{5}} \cdot \frac{\sqrt{5}}{\sqrt{5}} = \frac{2\sqrt{5}}{5}$$

Simplify:

$$\sqrt{\frac{2x}{3}} = \frac{\sqrt{2x}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{6x}}{3}$$

Simplify:

$$\frac{-3}{\sqrt[3]{2}} \cdot \frac{\sqrt[3]{2 \cdot 2}}{\sqrt[3]{2 \cdot 2}} = \frac{-3\sqrt[3]{4}}{2}$$

Simplify:

$$\frac{5}{\sqrt[3]{9}} \cdot \frac{\sqrt[3]{3}}{\sqrt[3]{3}} = \frac{5\sqrt[3]{3}}{3}$$

3 3

Simplify:

$$\frac{3}{\sqrt[4]{8x^3}} = \frac{3}{\sqrt[4]{2\cdot2\cdot2\cdot x\cdot x\cdot x}} \cdot \frac{\sqrt[4]{2x}}{\sqrt[4]{2x}}$$

only 3 only 3

2 4

2 2

$$= \frac{3\sqrt[4]{2x}}{2x}$$

Simplify:

need 5

$$\frac{4}{\sqrt[5]{16a^2}} = \frac{4}{\sqrt[5]{2\cdot 2\cdot 2\cdot 2\cdot a\cdot a}} \cdot \frac{\sqrt[5]{2\cdot a\cdot a\cdot a}}{\sqrt[5]{2\cdot a\cdot a\cdot a}}$$

8 2

4 2

2 2

need 5 of each

$$= \frac{4\sqrt[5]{2a^3}}{2a}$$

Assignment:

p.235 #82-100 even