Mth 28, Homework 7 on sections 8.3, 8.4

Due by Wed, Nov 12.

Write all your working out and answers neatly, using lots of space between questions, and showing your steps clearly. Each exercise is worth 2 points.

Section 8.3 Simplify rational exponents

(1) **(a)** Write $x^{1/4}$ as a radical.

(b) Write $(2y)^{1/3}$ as a radical.

(2) **(a)** Write $\sqrt{x}$ using a rational exponent.

(b) Write $\sqrt[5]{-3xy}$ using a rational exponent.

(3) **(a)** Write $x^{2/3}$ as a radical expression in two different ways.

(b) Write $\sqrt{m^5}$ using a rational exponent.

(c) Write $\left(\sqrt[4]{21w}\right)^7$ using a rational exponent.

(4) Evaluate:

(a) $64^{1/2}$

(b) $64^{2/3}$

(c) $(-64)^{2/3}$

(d) $-64^{2/3}$

(e) $64^{-1/6}$

(In part (d), remember that $-64^{2/3}$ means $-(64^{2/3})$. For part (e) use that $a^{-n} = \frac{1}{a^n}$.)

(5) Assume all variables are positive and simplify these. Keep the rational exponents – no need to convert to radicals.

(a) $x^{3/2} \cdot x^{1/4}$

(b) $\left(27x^{1/3}\right)^{2/3}$

(c) $\left(16x^{-2/5}y^{3/5}\right)^{5/2}$

(Use the properties of exponents, going step by step. For part (a) you should add the exponents – you'll need a common denominator.)

(6) Show how $\left(\dfrac{y^{4/3}}{9x^2}\right)^{1/2}$ simplifies down to $\dfrac{y^{2/3}}{3x}$

(7) Simplify: $\left(\dfrac{625x^4y^{-1/3}}{y^2}\right)^{3/4}$

(One way to start is to first simplify the inside part $\frac{y^{-1/3}}{y^2}$. Then use the Quotient to a Power property: $(a/b)^m = a^m/b^m$ ...)

Section 8.4 Add, subtract, and multiply radical expressions

(8) Simplify:

(a) $2\sqrt{5} + 8\sqrt{5}$

(b) $4\sqrt{3} + \sqrt{6} - 10\sqrt{6}$

(9) Simplify: $\sqrt{12} + 4\sqrt{3} - \sqrt{75}$

(Simplify the radicals first by taking out perfect square factors. Then you can add and subtract.)

(10) Simplify:

(a) $(4\sqrt{3})(2\sqrt{7})$

(b) $3\sqrt{5}(7 - 2\sqrt{5})$

(11) Simplify:

(a) $(8 + \sqrt{3})(5 - 2\sqrt{3})$

(b) $(10 - 3\sqrt{6})^2$

(You should be FOILing for both of these. And remember that $\sqrt{m}\sqrt{m} = m$.)

If you get stuck on a question or aren't sure if you understand it:

- Go over the relevant class notes and section in the textbook.
- Check if you get the right answer for a similar odd-numbered question in the textbook (answers at the back of the book).
- Ask me about it after class.
- Come to my office hours: Mon 11:30 - 12:30, Wed 11:30 - 12:30 in CP 317.
- Go to the Math Tutorial Lab in-person in CP 303 or online.