Math 114–MPS, Winter 2016 Exam Two Review

Instructor: Cheryl Jaeger Balm

Sections covered: 1.6–1.7, 7.1–7.6

Topics covered:

- **Exponent rules** *(1.6)*
  - Know how to apply the rules of exponents to expressions with positive and negative exponents.
  - *Sample problem:* Multiply $(-4x^{-5}y)(-2x^3y^{-4})^{-2}$
- **Scientific notation** *(1.7)*
  - Switch between decimal and scientific notation.
  - Multiply and divide numbers in scientific notation.
  - Word problems involving thousand (10^3), million (10^6), billion (10^9) and trillion (10^{12}).
  - *Sample problems:*
    - Write 1.03×10^4 in decimal notation.
    - Write 0.00006007 in scientific notation.
    - Write \$207 trillion in scientific notation.
    - Multiply $(1.5 \times 10^4)(9.8 \times 10^2)$. Answer in scientific notation.
- **Radicals and rational exponents** *(7.1–7.3)*
  - *Sample problems:*
    - Simplify $-\sqrt[3]{-27}$
    - Find the domain of $f(x) = \sqrt{1-x}$
    - Simplify $\left(x^{-1/3}y^{3/4}\right)^{-1/2}$
    - Simplify $\sqrt[3]{81x^6y^4}$
- **Adding and subtracting radicals and rational exponents** *(7.4)*
  - *Sample problems:*
    - $3\sqrt{20} - 5\sqrt{45}$
    - $3\sqrt{12x} + 3\sqrt{27x}$

- **Multiplying and dividing radicals and rational exponents** *(7.2–7.5)*
  - *Sample problems:*
    * $5^{1/2} \cdot 5^{1/5}$
    * $\dfrac{-20x^{1/3}}{5x^{4/3}}$
    * $(2\sqrt{2x^3})(-4\sqrt{8xy^7})$
    * $\dfrac{\sqrt[3]{80x^5}}{\sqrt[3]{2x}}$
    * $(1+\sqrt[4]{x})^2$
    * $\sqrt{6}\,(x^2-\sqrt{10})$
    * $\sqrt{x}\ \sqrt[5]{x}$
- **Rationalizing denominators** *(7.5)*
  - *Sample problems:* Rationalize the denominator in the following fractions
    * $\sqrt{\dfrac{x^2}{7y}}$
    * $\dfrac{1-\sqrt{7}}{\sqrt{5}+\sqrt{3}}$
- **Solving radical equations** *(7.6)*
  - If there is **one radical**: (1) *Isolate* the radical, (2) Raise both sides to the appropriate power, (3) Solve the equation, (4) Check for *extraneous solutions.*
  - If there are **two radicals**: (1) Get one radical on each side of the equation, (2) Raise both sides to the appropriate power, (3) Solve the equation – *use the steps for one radical if you are still left with a square root after squaring both sides*, (4) Check for *extraneous solutions.*
  - *Sample problems:*
    * $\sqrt{6x+7}-2=x$
    * $\sqrt{x+5}-2=\sqrt{x-3}$
    * $(x-3)^{1/4}+2=0$

Suggested exercises: You can do these exercises from your textbook in class if you are caught up on your worksheets and homework, or you may do them at home to help you study for the exam. If you complete them **all** and turn them in on the day of the exam they are worth a total of **3 points of extra credit**.

- Chapter 1 review p. 92-93: #87-108
- Chapter 7 review p. 557-559: #1-9, 13, 16-18, 21-31, 33-35, 37-75, 80-84