H. Algebra II Semester II Review
Part 3 – Exponent Properties, Complex Numbers, Radical Functions

Instructor: M. Wolverton

3.a Manipulating Expressions with Properties of Exponents

Simplify each expression: combine bases where possible, combine powers where possible, answers should not contain negative or zero exponents and fractions should be reduced.

1. $\left(3a^3b\right)^2\left(ab^3\right)^3$
2. $\left(-5k^3\right)\cdot\left(-2m+k^2\right)^2$
3. $\frac{y^{11}}{4z^3}\cdot\frac{8z^7}{y^7}$
4. $\left(\frac{5w^2z^3}{-10w^3z}\right)^2$
5. $\frac{2a^3x^{-2}}{a^2xy^{-1}}$
6. $\left(\frac{2a^{-2}}{b}\right)^{-3}$
7. $\frac{\left(-3x^2y\right)^2}{\left(2a^0xy^2\right)^3}$

3.b Manipulating Complex Numbers

Simplify the following complex number expressions. Write your answer $a+bi$, where a and b are real numbers.

1. $\left(-3+\frac{1}{2}i\right)^2$
2. $\frac{7+2i}{3-i}$
3. $\frac{3-i}{7+2i}$

3.c Solving Radical Equations

Find all real solutions of the following equations. Watch out for extraneous solutions. Extraneous solutions are most likely to occur when an even power is used during solving. Plug in values to the original equation to check for extraneous solutions.

1. $\sqrt{5-x}-1=x$
2. $\sqrt{4-2x-x^2}=x+2$
3. $\sqrt{5-x}=\sqrt{x}+1$

3.d Properties of Radical Functions

State the domain and range of the following functions.

1. $f(x)=\sqrt{2-3x}-5$
2. $f(x)=-5\sqrt{2x+6}$