**Math 20-1 Chapter 5 Radical Expressions and Equations Review**

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| **Key Ideas** | **Description or Example** | |
| Radical means root. The index determines which root you are looking for. |  | |
| Principle Square Root  Negative Square Root    Equations have with even degrees have roots.  Equations with odd degrees one have one root. | the root is positive  The radical is negative, the root will be negative | |
| Perfect Squares  Perfect Cubes  Perfect Fourth Roots | 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169…*x*2  1, 27, 64, 125, … *x*3  1, 16, 81,… *x*4 | |
| Perfect Square Roots  Perfect Cubes  Perfect Fourth Roots |  | |
| Convert entire radicals to mixed radicals  Remember  Entire  Mixed Radical. The radicand is in lowest terms. |  | not -3 |
| Convert mixed radicals to entire radicals  Apply the index as an exponent to the base under the radicand.  A negative does not enter the radicand, the entire radicand stays negative. |  | |
| Comparing and ordering radical expressions | Write as entire radicals to compare, apply the proper index.  Write as a decimal and compare. | |
| Identifying restrictions on the values for a variable in a radical expression.  The radicand must be greater or equal to zero. | For the restriction is  For the restriction is | |
| Simplifying radical expressions using addition or subtraction | Radicals must have the **same index** and the **same radicand** to be added or subtracted. Only add or subtract the coefficients.  Do not add radicands. | |
| Multiply radicals | Radicals must have the **same index.**  Multiply coefficients, multiply radicands, simplify. | |
| Divide radicals | Radicals must have the **same index.**  Divide coefficients, divide radicands, simplify.  , | |
| Rationalize the denominator  Monomial denominator | Binomial denominator | |
| Solve an equation with one radical term.  State restrictions on the variable in the radicand. Check for extraneous roots. | Isolate the radical term on one side of the equation and then apply the Power Rule with squares. Verify by substitution. | |
| Solve an equation with two radical terms  State restrictions on the variable in the radicand. Check for extraneous roots. | Separate the radicals, one on each side of the equal sign.  Square both sides of equation, not individual terms. | |

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| **Vocabulary** | **Definition** |
| Entire Radical | The coefficient is one. |
| Mixed Radical | The radicand is in simplest form. |
| Radicand | The quantity under the radical sign. |
| Index | The small number in a radical that indicates which root to take. |
| Rationalize the denominator | A procedure for converting a denominator containing a radical into a rational number. The value of the expression does not change. |
| Conjugates | Two binomial factors whose product is a difference of squares.  The conjugate of  is . |
| Restrictions on the variable | For even index  .  For odd index, the radicand may be any real numb. |

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| **Common Errors** | **Description** |
|  | Add the coefficients, not the radicands. |
| Distributing when multiplying two radicals. | Multiply coefficients and then multiply radicands. |
| Ignoring the index when simplifying. | Include indexes greater than 2. |
| Rationalizing the Denominator. | Not multiplying by the correct term. |
| Solving by squaring both sides of the = sign | You must square each side, not individual terms. |