**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 RootNegative 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 SquaresPerfect CubesPerfect Fourth Roots | 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169…*x*21, 27, 64, 125, … *x*31, 16, 81,… *x*4 |
| Perfect Square RootsPerfect CubesPerfect Fourth Roots |  |
| Convert entire radicals to mixed radicalsRemember EntireMixed 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 termsState 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. |