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| Unit # | Topic | Acquisition of Knowledge and Skills |
| 1 | Relationships Between Quantities and Reasoning with Equations and Inequalities | Students will be able to:   1. Classify numbers (0-2; P7) 2. Translate verbal expressions and equations (1-1; p. 5/2-1 p. 75) 3. Solve one-variable linear equations in the form of    1. one-step (2-2; p. 83)    2. multi-step (2-3; p. 91)    3. variables on both sides (2-4; p. 97)    4. basic rational equations (Proportions) (2-6; p. 111) 4. Solve literal equations (2-8; p. 126) 5. Solve one-variable linear inequalities and express the solution graphically and algebraically using set notation (5-1 to 5-3; p. 285-316)   Students will understand:   1. That a problem can have one solution, no solution, or infinitely many. (2-4; p. 97) 2. How to apply linear equations and inequalities for problem solving. (2-9; p. 132) |
| 2 | Two-Variable Linear Equations | Students will be able to:   1. utilize function notation to solve linear functions (1-6; p. 40, 1-7; p. 47) 2. construct graphs using tables and patterns (3-1; p. 155) 3. identify x-and y-intercepts (3-1; p. 155) 4. determine slopes of lines using graphs, tables, equations, and using the slope formula (3-3; p. 172/ 4-1; p. 216/ 4-2; 226) 5. graph linear equations (4-1; p. 216) 6. write equations from tables, graphs, and story problems (4-2; p. 226) 7. write the equation of the line: (4-2; p. 226)    1. given a slope and y-intercept (4-2; p. 226)    2. given a slope and a coordinate (4-2; p. 226)    3. given two coordinates (4-2; p. 226) 8. transform the equation of the line into slope-intercept form (4-3; p. 233) 9. write equations of parallel and perpendicular lines (4-4; p. 239)   Students will understand:   1. terminology associated with linear functions including domain/range and input/output (both set and interval notation). (1-6; p. 40, 1-7; p. 47) 2. slope is a rate of change and affects the steepness of the graph. (3-3; p. 172) 3. the relationship between the three forms of a linear equation    1. slope-intercept (4-1; p. 216)    2. point-slope (4-3; p. 233)    3. standard form (3-1; p. 155) 4. the relationship of the slopes of parallel and perpendicular lines. (4-4; p. 239) |
| 3 | Modeling and Linear Regression | Students will be able to:   1. construct and interpret a scatterplot    1. identify positive, negative, and no correlation (4-5; p. 247) 2. extrapolate and interpolate data to make predictions (4-5; p. 247/ 4-2; p. 228) 3. generate a line of best fit and a linear regression line (4-6; p. 255) 4. identify extreme data points (outliers) (0-12; P39) 5. model, solve, and interpret problems using linear equations (using a graph/word problem/data). (throughout) 6. use a graphical device to verify results (throughout)   Students will understand:   1. constraints in equations (4-2; p. 228) 2. the correlation coefficient (4-6; p. 255) 3. appropriate units as they apply to the graph and solution (throughout) |

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| 4 | Systems of Equations | Students will be able to:   1. solve linear systems of equations graphically (6-1; p. 335) 2. find points of intersection using a graphical device (graphically) (6-1; p. 342) 3. solve linear systems of equations algebraically (substitution and elimination/combination) (6-2; p. 345/ 6-3; p. 350/ 6-4; p. 356) 4. write and solve a system of linear equation in a real-world context (6-5; p. 364/ 6-6; 372) 5. estimate solutions by inspection of the equations (throughout)   Students will understand:   1. which method of solving linear system of equations is most appropriate (6-5; p.364) 2. when a system of equations is an appropriate model (6-5; p. 364) |
| 5 | 2-D and 3-D Geometry | Students will be able to:   1. Utilize volume formulas for cones, cylinders, and spheres and use them to solve real-world and mathematical problems (P29-30, p. 202, 644) 2. Explain a proof of the Pythagorean Theorem and its converse (p. 648-654) 3. Apply the Pythagorean Theorem to determine the unknown side length in right triangles in real-world and mathematical problems in two and three dimensions 4. Apply the Pythagorean Theorem to find the distance between two points 5. Verify the properties of rotations, reflections and translations   Students will understand:   1. the relationship between a figure and its image after the figure has been rotated, reflected, translated and dilated 2. the relationship between interior and exterior angles of a triangle 3. the relationship between the angles created when two parallel lines are cut by a transversal |
| 6 | Exponential Relationships | Students will be able to:   1. use the properties of exponents to interpret expressions for exponential expressions (7-1; p.391/ 7-2; p. 398/ 7-3; p. 406) 2. use scientific notation to express large or small numbers and perform operations (7-4; p. 414) 3. recognize an exponential pattern of change in a table and features of a graph (7-5; p. 424) 4. evaluate exponential functions algebraically (7-5; p. 424) 5. compare exponential and linear models (7-5; p. 428) + GGG material 6. calculate the growth and decay factor (7-6; p. 432) 7. write an exponential growth and decay equation (7-6; p. 432) 8. solve problems involving growth and decay (7-6; p. 432) 9. verify results using a graphical device (throughout)   Students will understand:   1. rate of decay/growth vs decay/growth factor (7-6; p. 432) 2. a growth vs. decay equation (7-6; p. 432) |

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| 7 | Polynomials | Students will be able to:   1. classify polynomials using appropriate terminology (naming by number of terms, determining degree, etc) (8-1; p. 465) 2. re-write polynomials in descending order (8-1; p. 465) 3. operate with polynomials (adding/subtracting/multiplying/dividing (including long division) (8-1; p. 465/ 8-2; p. 472/ 8-3; p. 480) 4. factor polynomials with a leading coefficient of 1 (\*\*No prime polynomials until unit 9) including:    1. perfect square trinomials (8-4; p. 488/ 8-9; p. 522)    2. greatest common factor (8-5; p. 494)    3. grouping (8-5; p. 494)    4. trinomials (8-6; p. 503/ 8-7; p. 510)    5. difference of two squares (8-8; p. 516) |
| 8 | Quadratic Functions and Modeling | Students will be able to:   1. identify and compare linear, exponential, quadratic from tables, graphs, and equations (9-6; p. 590) 2. graph a quadratic equation in standard form () using a table of values and identify (9-1; p. 543)    1. axis of symmetry 🡪    2. vertex 🡪    3. minimum/maximum    4. x – and y – intercept (graphically) 3. find x-intercepts by using the zero-product property and quadratic formula (9-2; p. 556) 4. graph a quadratic equation in vertex form and identify: (9-3; p. 564)    1. direction of opening    2. vertex    3. axis of symmetry    4. minimum/maximum    5. x – and y - intercepts 5. write equations given a vertex and coordinate 6. solve modeling problems using: (throughout)    1. projectile motion    2. optimization (maximum/minimum)   Students will understand:   1. the vertex and standard form characteristics and how it affects the graph 2. the difference between identifying whether there is maximum or minimum and the actual maximum/minimum value of a quadratic function 3. associated terminology (zeros, roots, x- intercepts, etc.) (9-1 to 9-3 p. 543-573) 4. the application of domain and range |
| 9 | Radicals | Students will be able to:   1. simplify radical expressions (10-2; p. 628) 2. operate with radicals (10-3; p.635) 3. rationalize the denominator (integer denominators) (10-2; p. 628) 4. solve quadratic equations (ex. x2=49) (8-9; p. 525 see Unit 7, 4a. above)solve radical equations (10-4; p. 642) 5. find exact solutions using the quadratic formula (9-5; p. 583) 6. solve radical equations (10-4; p. 642)   Students will understand:   1. reasons for rationalizing the denominator (integer denominators) (10-2; p. 628) |