Glencoe

*ADVANCED MATHEMATICAL CONCEPTS: PRECALCULUS WITH APPLICATIONS* ©2004

Correlation to:

Missouri Framework for Curriculum Development in Mathematics

Grades 9–12

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| **I. Problem Solving** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. use problem-solving strategies to investigate and understand mathematical content (NCTM Standard 1; MO 1.6, 3.5) | TWE: 4c, 66c, 126c, 204c, 276c, 342c, 426c, 484c, 552c, 614c, 684c, 758c, 836c, 888c, 940c |
| b. recognize and formulate problems from situations within and outside mathematics (NCTM Standard 1; MO 3.1, 3.5) | SE: 38–44, 49, 112–113, 118, 132, 167, 234, 256, 258–264, 282, 312, 327, 387–394, 527–534, 637–638, 666–667, 717, 740–747, 759, 873, 906, 951, 954<br><br>TWE: 13, 38–44, 49, 67, 75, 112–113, 118, 132, 167, 190, 234, 256, 258–264, 277, 282, 312, 327, 352, 387–394, 396, 448, 485, 513, 526, 527–534, 586, 637–638, 666–667, 679, 717, 733, 740–747, 759, 806, 822, 873, 875, 889, 906, 909, 925, 942, 951, 954 |
| c. organize, develop and apply integrated mathematical problem-solving strategies to solve problems within and outside mathematics (NCTM Standard 1; MO 3.2, 3.3) | SE: 61, 112–113, 116, 118, 132, 167, 178, 234, 256, 258–264, 271, 282, 312, 327, 350, 387–394, 527–534, 637–638, 666–667, 717, 740–747, 759, 794–795, 873, 906<br><br>TWE: 61, 112–113, 116, 118, 132, 167, 178, 234, 256, 258–264, 271, 282, 312, 327, 350, 387–394, 527–534, 637–638, 666–667, 717, 740–747, 759, 794–795, 873, 906 |
| d. apply the process of mathematical modeling to real-world problem situations (NCTM Standard 1; MO 2.1, 3.6) | SE: 34–38, 78–96, 258–264, 387–394, 527–535, 565–566, 706, 712, 740–748<br><br>TWE: 25, 34–38, 78–96, 158, 258–264, 266, 298, 318, 326, 351, 386, 387–394, 445, 527–535, 565–566, 567, 661, 706, 712, 732, 740–748, 785, 805, 828, 849, 880, 925, 949 |

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| e. analyze, evaluate, and reflect upon the process(es) used in solving problems (NCTM Standard 1; MO 2.2, 3.4, 3.6, 3.7, 3.8) | SE: 11, 30, 85, 135, 150, 187, 211, 234, 248, 289, 303, 349, 365, 386, 402, 435, 455, 469, 492, 504, 525, 541, 559, 579, 597, 621, 747, 856, 895, 959<br><br>TWE: 11, 30, 67, 75, 85, 135, 150, 187, 190, 211, 234, 248, 258, 277, 289, 303, 349, 352, 365, 386, 396, 402, 435, 448, 455, 469, 485, 492, 504, 513, 525, 526, 541, 559, 579, 586, 597, 621, 679, 733, 747, 806, 822, 856, 875, 889, 895, 909, 925, 959 |
| **II. Communication** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. reflect upon and clarify thinking about mathematical ideas and relationships (NCTM Standard 2; MO 1.6, 2.2) | SE: 18, 37, 118, 144, 150, 187, 211, 234, 248, 289, 303, 349, 365, 386, 402, 435, 455, 469, 492, 504, 525, 606, 737, 844, 924, 932, 974<br><br>TWE: 18, 37, 118, 144, 150, 187, 211, 234, 248, 289, 303, 349, 365, 386, 402, 435, 455, 469, 492, 504, 525, 606, 737, 844, 924, 932, 974 |
| b. interpret generalizations discovered through investigations to formulate, revise, and adjust mathematical definitions (NCTM Standard 2; MO 1.2, 1.7, 2.2) | The opportunity to address this objective is available. See the following:<br><br>SE: 25, 43, 110, 157, 179, 195, 211, 234, 248, 289, 303, 349, 365, 386, 402, 435, 455, 469, 492, 504, 525, 541, 701, 812, 915, 932<br><br>TWE: 25, 43, 110, 157, 179, 195, 211, 234, 248, 289, 303, 349, 365, 386, 402, 435, 455, 469, 492, 504, 525, 541, 701, 812, 915, 932 |
| c. visualize mathematical ideas by reading about, listening to, or viewing concrete models (NCTM Standard 2; MO 1.9, 2.4) | The opportunity to address this objective is available. See the following:<br><br>TWE: 53, 101, 226, 381, 466, 502, 576, 644, 657, 729, 770, 789, 848, 862, 945 |
| d. plan and create effective verbal and non-verbal forms of communicating mathematics for a variety of purposes and audiences (NCTM Standard 2; MO 2.1) | The opportunity to address this objective is available. See the following:<br><br>TWE: 31, 51, 151, 212, 235, 334, 403, 461, 511, 585, 641, 703, 773, 821, 917 |
| e. present mathematical ideas and logical justifications, both written and oral (NCTM Standard 2; MO 2.1, 3.5, 4.1) | The opportunity to address this objective is available. See the following:<br><br>TWE: 31, 51, 151, 212, 235, 334, 403, 461, 511, 585, 641, 703, 773, 821, 917 |

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| f. ask clarifying and extending questions about the mathematics read about, heard about, or viewed through models (NCTM Standard 2; MO 2.3) | The opportunity to address this objective is available. See the following:<br><br>SE: 11, 31, 85, 145, 168, 187, 195, 241, 303, 350, 394, 454, 498, 542, 559, 572, 591, 640, 701, 737, 746, 772, 782, 792, 844, 878, 925, 968<br><br>TWE: 11, 31, 85, 145, 168, 187, 195, 241, 303, 350, 394, 454, 498, 542, 559, 572, 591, 640, 701, 737, 746, 772, 782, 792, 844, 878, 925, 968 |
| g. recognize the economy, power, and elegance of mathematics notation and its role in the development of mathematical ideas (NCTM Standard 2; MO 1.6, 1.9, 2.4) | The opportunity to address this objective is available. See the following:<br><br>SE: 25, 43, 110, 157, 179, 195, 211, 234, 248, 289, 303, 387–394, 527–535, 565–566, 706, 712, 740–748<br><br>TWE: 25, 43, 110, 157, 179, 195, 211, 234, 248, 289, 303, 387–394, 527–535, 565–566, 706, 712, 740–748 |
| h. read, write, and talk about mathematical ideas as they relate to real-life applications and multiple workplace situations (NCTM Standard 2; MO 1.10, 2.6, 3.2, 4.8) | SE: 110, 152, 157, 179, 195, 211, 234, 248, 289, 303, 387–394, 417, 527–535, 565–566, 706, 712, 737, 799, 919–920<br><br>TWE: 110, 152, 157, 179, 195, 211, 234, 248, 289, 303, 387–394, 417, 527–535, 565–566, 706, 712, 737, 799, 919–920 |
| **III. Reasoning** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. make and test conjectures (NCTM Standard 3; MO 1.7) | SE: 827–829, 832<br><br>TWE: 827–829, 832 |
| b. defend the validity of their conclusions using mathematical strategies (NCTM Standard 3; MO 3.4, 3.7, 3.8, 4.1) | SE: 24, 43, 103, 135, 144, 157, 212, 249, 311, 365, 393, 411, 436, 460, 510, 541, 566, 605, 652, 714, 736, 747, 805, 828, 850, 895, 947, 968<br><br>TWE: 24, 43, 103, 135, 144, 157, 212, 249, 311, 365, 393, 411, 436, 460, 510, 541, 566, 605, 652, 714, 736, 747, 805, 828, 850, 895, 947, 968 |

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| c. follow the mathematical reasoning of others and determine validity (NCTM Standard 3; MO 1.5, 2.3) | The opportunity to address this objective is available. See the following:<br><br>SE: 57, 101, 115, 155, 218, 280, 330, 383, 400, 441, 518, 539, 595, 658, 708, 744, 811, 826, 848, 892, 914, 930, 948, 966<br><br>TWE: 57, 101, 115, 155, 218, 280, 330, 383, 400, 441, 518, 539, 595, 658, 708, 744, 811, 826, 848, 892, 914, 930, 948, 966 |
| d. apply inductive and deductive reasoning (NCTM Standard 3; MO 3.5) | SE: 827–829, 832<br><br>TWE: 827–829, 832 |
| **IV. Connections** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. recognize and/or derive equivalent representations for a concept (NCTM Standard 4; MO 1.6) | SE: 61, 123, 201, 271, 339, 417, 481, 547, 611, 691, 753, 833, 885, 937, 981<br><br>TWE: 61, 123, 201, 271, 339, 417, 481, 547, 611, 691, 753, 833, 885, 937, 981 |
| b. analyze and relate procedures in multiple representations (NCTM Standard 4; MO 1.5, 3.6) | SE: 22, 48–50, 72, 86, 111, 146, 149–151, 198, 200, 221, 242, 298, 378, 382, 384–385, 400–401, 405, 416–417, 561–563, 578–579, 713, 718<br><br>TWE: 22, 48–50, 72, 86, 111, 146, 149–151, 198, 200, 221, 242, 298, 378, 382, 384–385, 400–401, 405, 416–417, 561–563, 578–579, 713, 718 |
| c. relate and describe the connections within topics of mathematics and other disciplines (NCTM Standard 4; MO 1.6, 1.8, 1.10) | SE: 24, 45, 62, 105, 167, 211–212, 249, 256, 310, 323, 366, 468, 485, 535–536, 541, 577–578, 659, 670, 709, 736, 791, 820, 828, 880, 905–907<br><br>TWE: 24, 45, 62, 105, 167, 211–212, 249, 256, 310, 323, 366, 468, 485, 535–536, 541, 577–578, 659, 670, 709, 736, 791, 820, 828, 880, 905–907 |
| d. investigate and determine the importance of mathematics in their lives, future careers, and our ever-changing global society (NCTM Standard 4; MO 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8) | SE: 12, 105, 136, 221, 312, 358, 420, 499, 598, 622, 703, 800, 851, 896, 976<br><br>TWE: 12, 105, 136, 221, 312, 358, 420, 499, 598, 622, 703, 800, 851, 896, 976 |
| e. evaluate the logic and aesthetics of mathematics as they relate to the universe (NCTM Standard 4; MO 1.10, 2.4) | This objective is covered in Glencoe *Algebra 1,* ©2003<br>SE: 47, 92, 135, 136, 153, 303, 378, 548, 688 |

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| **V. Number Sense** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. develop, analyze, and explain procedures used for representing and analyzing relationships in tables, verbal rules, equations, and graphs (NCTM Standards 5 and 6; MO 1.6, 1.8, 1.10, 2.6) | SE: 138, 141, 200, 211, 242, 285–289, 362, 365, 373, 377, 379–381, 384–386, 390, 394, 400–401, 416–417, 659, 709, 713<br><br>TWE: 138, 141, 200, 211, 242, 285–289, 362, 365, 373, 377, 379–381, 384–386, 390, 394, 400–401, 416–417, 659, 709, 713 |
| b. analyze the effects of parameter changes on the graphs of functions (NCTM Standards 5 and 6; MO 1.6, 3.6, 4.1, 4.7) | SE: 22, 24–25, 45, 140–141, 183, 258, 262, 623–630, 631–641, 647–652, 653–660, 662–669, 670–677, 695–703, 704–711, 712–716, 718–725, 746<br><br>TWE: 22, 24–25, 45, 140–141, 183, 258, 262, 623–630, 631–641, 647–652, 653–660, 662–669, 670–677, 695–703, 704–711, 712–716, 718–725, 746 |
| c. analyze and describe relationships and the resulting effects between changes in an independent variable and a dependent variable (NCTM Standards 5 and 6; MO 1.6, 3.3, 4.1) | SE: 7, 39, 522, 581, 741–742<br><br>TWE: 7, 39, 522, 581, 741–742 |
| **VI. Geometric and Spatial Sense** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. interpret and draw three-dimensional objects (NCTM Standard 7; MO 1.5, 1.9, 2.7) | SE: 500–504, 535–542<br><br>TWE: 500–504, 535–542 |
| b. represent and solve problem situations with geometric models and apply properties of figures (NCTM Standard 7; MO 1.5, 2.7, 3.7) | SE: 35–36, 123, 135, 236, 300, 326, 357, 429, 468, 476, 498, 510, 541, 620, 661, 732, 782, 845, 856, 947–948, 975<br><br>TWE: 35–36, 123, 135, 236, 300, 326, 357, 429, 468, 476, 498, 510, 541, 620, 661, 732, 782, 845, 856, 947–948, 975 |
| c. classify figures in terms of congruence and similarity and apply these relationships (NCTM Standard 7; MO 1.1, 1.4, 1.6, 3.5) | SE: 92, 284–285, 483<br><br>TWE: 92, 284–285, 483 |
| d. deduce properties of, and relationships between, figures from given assumptions (NCTM Standard 7; MO 1.6, 1.8, 2.4, 3.5) | SE: 92, 272, 284–285, 423, 477, 483, 505, 586, 612–613, 782<br><br>TWE: 92, 272, 284–285, 423, 477, 483, 505, 586, 612–613, 782 |

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| e. translate between synthetic and coordinate representations using a variety of methods and technologies (NCTM Standard 8; MO 1.4, 2.7) | The opportunity to address this objective is available. See the following:<br><br>SE: 92–95, 121, 137, 140–142, 144–145, 149, 182, 185–187, 272, 500–504, 535–536, 539–542, 615–622, 670–677<br><br>TWE: 92–95, 121, 137, 140–142, 144–145, 149, 182, 185–187, 272, 500–504, 535–536, 539–542, 615–622, 670–677 |
| f. deduce properties of figures using transformations and coordinates (NCTM Standard 8; MO 2.4, 3.5) | The opportunity to address this objective is available. See the following:<br><br>SE: 88, 137, 140–142, 144–145, 149, 182, 185–187, 200, 228, 272, 500–504, 535–536, 539–542, 597, 615–622<br><br>TWE: 88, 137, 140–142, 144–145, 149, 182, 185–187, 200, 228, 272, 500–504, 535–536, 539–542, 597, 615–622 |
| g. identify congruent and similar figures using transformations (NCTM Standard 8; MO 1.5, 3.5, 3.6) | The opportunity to address this objective is available. See the following:<br><br>SE: 92<br><br>TWE: 92 |
| h. analyze properties of transformations and relate translations to vectors (NCTM Standard 8; MO 1.6, 2.4, 3.6, 4.1) | SE: 500–504, 535–542<br><br>TWE: 500–504, 535–542 |
| i. apply an understanding of perimeter, area, volume, angle measure, capacity, weight and mass (NCTM Standard 7; MO 2.5, 3.3, 4.1) | SE: 71, 77, 105, 123, 168, 178, 188, 192–194, 226, 233, 235, 248, 272, 277, 291, 303, 307, 316, 331, 341, 350, 510, 548–549, 579, 640, 661, 701, 755, 809, 947, 975<br><br>TWE: 71, 77, 105, 123, 168, 178, 188, 192–194, 226, 233, 235, 248, 272, 277, 291, 303, 307, 316, 331, 341, 350, 510, 548–549, 579, 640, 661, 701, 755, 809, 947, 975 |
| j. model, describe, and analyze maximum and minimum points on a graph (NCTM Standard 13; MO 1.6, 2.1, 4.3, 4.7) | SE: 170–172, 173–177, 179, 199, 201, 225, 653–661, 667<br><br>TWE: 170–172, 173–177, 179, 199, 201, 225, 653–661, 667 |
| k. model, describe, and analyze patterns of sequences through processes of geometric change, approximations, and limits (NCTM Standard 14; MO 1.6, 2.1, 4.3, 4.7) | SE: 766–769, 771–773, 783, 793, 800, 830, 960<br><br>TWE: 766–769, 771–773, 783, 793, 800, 830, 960 |

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| l. recognize and apply trigonometry to problem situations (NCTM Standard 9; MO 3.1, 3.6, 4.2, 4.8) | SE: 300–303, 306, 309–311, 313–318, 321–323, 327–330, 332, 335, 338, 437, 445, 455, 510, 516, 718, 821, 874<br><br>TWE: 300–303, 306, 309–311, 313–318, 321–323, 327–330, 332, 335, 338, 437, 445, 455, 510, 516, 718, 821, 874 |
| **VII. Data Analysis, Probability and Statistics** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. interpret and summarize data from charts, tables, and graphs that appear in real-world situations (NCTM Standard 10; MO 1.1, 1.8) | SE: 857, 889–896, 903–906, 913–914, 931, 933–934, 938<br><br>TWE: 857, 889–896, 903–906, 913–914, 931, 933–934, 938 |
| b. apply curve-fitting to make defendable predictions (NCTM Standard 10; MO 1.4, 2.7, 3.2) | SE: 38, 40, 41, 51, 60, 145, 151, 258–263, 270, 351, 592, 741, 744–745, 747<br><br>TWE: 38, 40, 41, 51, 60, 145, 151, 258–263, 270, 351, 592, 741, 744–745, 747 |
| c. apply the appropriate statistical measures including central tendency, variability, and correlation to a situation (NCTM Standard 10; MO 1.2, 1.5, 3.2) | SE: 897–908, 909–917, 933<br><br>TWE: 897–908, 909–917, 933 |
| d. investigate the effects of data transformations on variability and measures of central tendency (NCTM Standard 10; MO 1.1, 1.4, 2.7) | SE: 897–907, 908–917<br><br>TWE: 897–907, 908–917 |
| e. investigate the concept of a random variable (NCTM Standard 10; MO 1.4, 2.7, 3.2) | This objective is covered in Glencoe *Algebra 1*, ©2003<br>SE: 777-781<br><br>TWE: IE 778 |
| f. design and interpret simulations to estimate probabilities (NCTM Standard 11; MO 1.3, 3.3, 3.6) | SE: 876–881, 924<br><br>TWE: 876–881, 924 |
| g. apply theoretical probability to real-world problems (NCTM Standard 11; MO 1.7, 3.8) | SE: 877–881<br><br>TWE: 877–881 |
| h. apply experimental probability to real-world problems (NCTM Standard 11; MO 1.7, 3.8) | SE: 876–880<br><br>TWE: 876–880 |
| i. collect, plot, and interpret data, including that from a discrete probability distribution (NCTM Standard 11; MO 1.2, 1.6, 3.6) | SE: 918–925, 935<br><br>TWE: 918–925, 935 |

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| j. develop, interpret, and apply the normal curve in problem solving (NCTM Standard 11; MO 1.1, 3.2, 3.4) | SE: 918–925, 935<br><br>TWE: 918–925, 935 |
| k. determine and interpret maximum and minimum values within a data set, on a graph, or in a problem situation (NCTM Standard 13; MO 1.3, 2.1, 3.6) | SE: 171, 173–177, 188, 197, 199, 207, 211, 228, 257, 392, 413, 469, 641, 711, 748, 798, 951, 959, 968<br><br>TWE: 171, 173–177, 188, 197, 199, 207, 211, 228, 257, 392, 413, 469, 641, 711, 748, 798, 951, 959, 968 |
| l. analyze an infinite series as it relates to a limiting value (NCTM Standard 13; MO 1.6, 1.8, 3.2) | SE: 774, 777–778, 829<br><br>TWE: 774, 777–778, 829 |
| **VIII. Patterns and Relationships** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. compare and contrast the real number system and its various subsystems with regard to their structural characteristics (NCTM Standard 14; MO 1.6, 1.8) | SE: 8, 46, 86, 205–207, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 738, 810–811, 816<br><br>TWE: 8, 46, 86, 205–207, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 738, 810–811, 816 |
| b. represent and analyze relationships using verbal rules, tables and graphs as tools to interpret expressions, equations and inequalities (NCTM Standards 5 and 6; MO 1.6, 1.8, 2.1, 3.3) | SE: 72, 86, 118, 133, 156, 221, 298, 379–381, 384–385, 405, 416–417, 455, 459, 552–557, 578–579, 608, 659, 677, 708–709, 713, 722, 857, 892<br><br>TWE: 72, 86, 118, 133, 156, 221, 298, 379–381, 384–385, 405, 416–417, 455, 459, 552–557, 578–579, 608, 659, 677, 708–709, 713, 722, 857, 892 |
| c. translate among tabular, symbolic, and graphical representations of functions and model real-world phenomena with a variety of functions (NCTM Standard 6; MO 1.6, 1.8, 2.2, 3.6) | SE: 5–6, 9–12, 19, 25, 37, 51, 57, 61, 179, 200, 242, 367, 377, 384–386, 390, 394, 400–401, 436, 416–417, 560, 659, 684, 709, 713–714, 968<br><br>TWE: 5–6, 9–12, 19, 25, 37, 51, 57, 61, 179, 200, 242, 367, 377, 384–386, 390, 394, 400–401, 436, 416–417, 560, 659, 684, 709, 713–714, 968 |

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| d. represent situations that involve variable quantities with expressions, equations and inequalities (NCTM Standard 5; MO 1.6, 1.8, 3.3) | SE: 16, 20–21, 56, 149–150, 169, 180–181, 188, 198, 213–215, 250, 253, 270, 504, 520–527, 595–597, 609–610, 691, 707–708, 716, 793, 832<br><br>TWE: 16, 20–21, 56, 149–150, 169, 180–181, 188, 198, 213–215, 250, 253, 270, 504, 520–527, 595–597, 609–610, 691, 707–708, 716, 793, 832 |
| e. solve equations and inequalities (NCTM Standard 5; MO 1.6, 1.8, 2.2, 3.3) | SE: 16, 20–21, 22–25, 57, 149, 169, 188, 206, 209, 213–214, 252, 240, 248, 250, 261, 264, 267, 271, 378, 498, 571–572, 606–607, 691, 707–708<br><br>TWE: 16, 20–21, 22–25, 57, 149, 169, 188, 206, 209, 213–214, 252, 240, 248, 250, 261, 264, 267, 271, 378, 498, 571–572, 606–607, 691, 707–708 |
| f. translate between synthetic and coordinate representation for geometric relationships (NCTM Standard 8; MO 1.6, 1.8, 2.2, 3.3) | SE: 272, 615–622<br><br>TWE: 272, 615–622 |
| g. investigate limiting processes by examining infinite sequences and series (NCTM Standard 13; MO 1.6, 1.8, 3.3) | SE: 774–780, 786, 790–791, 795, 829, 831<br><br>TWE: 774–780, 786, 790–791, 795, 829, 831 |
| h. apply trigonometry to problem situations involving triangles and explore real-world phenomena using the sine, cosine, and tangent functions (NCTM Standard 9; MO 1.6, 1.8, 2.2, 3.6) | SE: 287–289, 306, 309–311, 313–318, 321–323, 327–330, 332, 335–336, 338, 437, 445, 455, 510, 516, 718, 821<br><br>TWE: 287–289, 306, 309–311, 313–318, 321–323, 327–330, 332, 335–336, 338, 437, 445, 455, 510, 516, 718, 821 |
| i. analyze effects of parameter changes on the graphs of functions using a variety of technologies to gather data (NCTM Standard 6; MO 1.4, 1.6, 2.7, 3.3) | SE: 22, 24–25, 45, 183, 258, 262, 140–141, 623–630, 631–641, 647–652, 653–660, 662–669, 670–677, 695–703, 704–711, 712–716, 718–725, 746<br><br>TWE: 22, 24–25, 45, 183, 258, 262, 140–141, 623–630, 631–641, 647–652, 653–660, 662–669, 670–677, 695–703, 704–711, 712–716, 718–725, 746 |

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| **IX. Mathematical Systems and Number Theory** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. compare and contrast the real number system and its various subsystems (NCTM Standard 14; MO 2.1, 4.1) | SE: 46, 86, 205–207, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 738, 810–811<br><br>TWE: 46, 86, 205–207, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 738, 810–811 |
| b. select and apply appropriate technology as a problem-solving tool to achieve understanding of the logic of algebraic and geometric procedures (NCTM Standard 14; MO 1.4, 3.6) | SE: 13, 69, 86, 106, 133, 177, 211, 232, 265, 284, 333, 378, 404, 458, 526, 566, 602, 628, 639, 641, 695, 705, 784, 809, 877, 926, 945, 949<br><br>TWE: 13, 69, 86, 106, 133, 177, 211, 232, 265, 284, 333, 378, 404, 458, 526, 566, 602, 628, 639, 641, 695, 705, 784, 809, 877, 926, 945, 949 |
| c. investigate and determine similarities and differences between mathematical systems (NCTM Standard 14; MO 2.1, 4.1, 4.6) | SE: 8, 106, 205–207, 216, 235, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 807, 810–811, 816<br><br>TWE: 8, 106, 205–207, 216, 235, 362, 421, 448, 493, 556, 580–581, 589–593, 596–597, 606–607, 665, 697–698, 705, 807, 810–811, 816 |
| d. extend understanding and application of number theory concepts (NCTM Standard 6; MO 1.6, 3.2, 3.3) | SE: 77, 805, 813–814, 826, 828<br><br>TWE: 77, 805, 813–814, 826, 828 |
| **X. Discrete Mathematics** | |
| ***By the end of grade 12, all students should be able to:*** | |
| a. explore and solve application problems involving graph theory (airline routes, circuits, paths, connecting roads, coloring a map, etc.) (NCTM Standard 12; MO 1.6, 1.8, 2.2, 3.2, 3.3, 3.6) | This objective is covered in Glencoe *Algebra I,* ©2003<br>SE: 194-195<br>TWE: IE 194<br>OA 196 |
| b. use tree, Venn, or student-developed diagrams as problem-solving tools (NCTM Standard 12; MO 3.2, 3.3, 3.6) | SE: 837–843, 861–864, 886<br><br>TWE: 837–843, 861–864, 886 |
| c. use concepts from logic and/or truth tables to recognize valid and invalid arguments (NCTM Standard 3; MO 2.2, 3.5) | This objective is covered in Glencoe A*lgebra 2* ©2003<br>SE: *Critical Thinking* 114, 133, 255, 364, 416, 452, 489, 537, 587<br>TWE: E 586 |

| CONTENT STANDARDS | PAGE REFERENCES |
|---|---|
| d. explore applications from counting techniques such as Pascal's Triangle, permutations, combinations, and Fibonacci sequence (NCTM Standard 12; MO 1.6, 2.2, 3.6) | SE: 784, 801–802, 804, 806, 813, 839–851, 881–882, 885–886<br><br>TWE: 784, 801–802, 804, 806, 813, 839–851, 881–882, 885–886 |
| e. investigate the concepts of *game theory** (NCTM Standard 1; MO 3.2, 3.7, 3.8) *game theory: selecting the best strategies in order to achieve the most favorable outcomes. Games are defined as having two or more players with conflicting interests. | This objective is covered in Glencoe *Algebra 1,* ©2003<br>SE: 100, 422<br>TWE: 100, 422 |
| f. explore concepts from election theory (NCTM Standard 1; MO 3.2, 3.7, 4.2, 4.3) | This objective is covered in Glencoe *Algebra 2,* ©2003<br>SE: *Check for Understanding* 655 |
| g. investigate different approaches to apportionment and fair division, then explore their applications (e.g., division of property in estates, apportionment in the House of Representatives) (NCTM Standard 1; MO 3.2, 3.3, 3.7, 4.3) | This objective is covered in Glencoe *Algebra I,* ©2003<br>SE: 84-87, 661, 663, 669-670<br>TWE: 84-87, 661, 663, 669-670<br>IE 661 |
| h. use the concept of recursion in mathematics to solve application problems (e.g., compound interest, depreciation, radium decay, maximum storage in the least amount of space, fractals) (NCTM Standard 12; MO 1.8, 2.2, 3.2, 3.7) | SE: 760–765, 766–770, 824<br><br>TWE: 760–765, 766–770, 824 |