

GLENCOE CORRELATION
ADVANCED MATHEMATICAL CONCEPTS
PRECALCULUS WITH APPLICATIONS
NEVADA
Mathematics Content Standards
Grade Twelve

CONTENT STANDARDS	PAGE REFERENCES
Numbers, Number Sense, and Computation	
Content Standard 1.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will accurately calculate, use estimation techniques, number relationships, operation rules, and algorithms; they will determine the reasonableness of answers and the accuracy of solutions.</i>	
By the end of Grade 12 , students know and are able to do everything required in the previous grades and:	
1.12.1 Calculate and estimate sums, differences, products, quotients, powers , and roots using mental math, formulas , and algorithms . S 23.12.3; C 4.12.1	I/S SE: 7, 64 #2, 65 #5-#6 & #8, 695-698, 700-701 TWE: MC 5
1.12.2 Apply the laws of exponents to perform operations on expressions with integral exponents and expressions in scientific notation. S 1.12.2	W/L SE: 7, 64 #2, 65 #6, 273 #6, 282 #62, 695-696, 700-701, 727 TWE: MC 5 IE 696
1.12.3 Apply the properties and theories of the real number system to everyday situations. S 1.12.2; H 3.12.4	I/S SE: 8, 45, 206 <i>Graphing Calculator Exploration</i> 86 TWE: PS 206
1.12.5 Perform simple operations on matrices .	W/L SE: 80-85, 89-95, 96 #35, 136 #44, 250 #54, 671 TWE: MC 88, 98 IE 80-82, 89-92
Patterns, Functions, and Algebra	
Content Standard 2.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use various algebraic methods to analyze, illustrate, extend, and create numerous representations (words, numbers, tables, and graphs) of patterns, functions, and algebraic relations as modeled in practical situations.</i>	
2.12.2 Represent and solve problems using discrete structures including graphs and matrices, with and without technology. Ec 3.12.2; H 4.12.1; H 5.12.1	E/L SE: 38-44, 45-51, 78-85, 112-118, 258-264, 527-533, 704-711, 718-725 TWE: IE 39, 260

CONTENT STANDARDS	PAGE REFERENCES
<p>2.12.3 Create and use different forms of a variety of equations, proportions, and/or formulas (e.g., $I=PRT$ or $R=I/PT$), solving for the needed variable as necessary in given situations. H 3.12.4; H 4.12.1; S 1.12.2; S 1.12.4; S 20.12.1; S 23.12.2</p>	<p>E/S SE: 28, 190-196, 692, 693 #4 & #8 TWE: IE 190-191</p>
<p>2.12.4 Add, subtract, multiply, and factor (1^{st} and 2^{nd} degree) polynomials, describing each step in the process and the connection between the algebraic process and the arithmetic process; use simple quadratic equations with integer roots to solve practical and mathematical problems. H 3.12.4; H 4.12.1; S 23.12.2</p>	<p>I/S SE: 141, 213-220, 268, 755 #2 TWE: MC 222</p>
<p>2.12.5 Model practical problems from everyday situations with a variety of models that includes matrices, translating among tabular, symbolic and graphical representations of functions, with and without technology. Ec 3.12.2; Ec3.12.3; Ec 3.12.4; Ec 6.12.6; G 1.12.3; H 3.12.4; H 4.12.1; S 1.12.2</p>	<p>E/S SE: 38-44, 45-51, 78-85, 112-118, 258-264, 527-533, 704-711, 718-725 TWE: IE 39, 260</p>
<p>2.12.6 Determine the domain and range of linear relations given a graph or a set of ordered pairs; explain their importance in problem-solving situations. H 5.12.1</p>	<p>W/L SE: 45-50, 152-158, 180-188, 359-366, 368-376, 378-386, 395-403, 405-412, 704-710, 729, 734-735, 740-747 <i>Graphing Calculator Exploration</i> 404, 433, 738-739 TWE: MC 52</p>
<p>2.12.7 Solve systems of two linear equations, both algebraically and graphically; use graphing calculators as a primary tool in solving these problems and to verify solutions found by other methods.</p>	<p>W/L SE: 67-72, 77 #24, 100-104, 120, 122 TWE: MC 73, 107</p>
Measurement	
Content Standard 3.0: To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will use appropriate tools and techniques of measurement to determine, estimate, record, and verify direct and indirect measurements.	
<p>3.12.1 Convert between customary and metric systems; convert among monetary systems.</p>	<p>I/L See Glencoe's <i>Algebra 2</i> SE: 390, 393 #12-#13</p>

CONTENT STANDARDS		PAGE REFERENCES
3.12.2 Select and use measurement tools, techniques, and formulas to calculate and compare rates, cost, distances, interest, temperatures, and weight/mass. S 2.12.1	I/S	SE: 190-191 TWE: IE 190
3.12.3 Distinguish and differentiate among the structures, language and uses of systems of measures (e.g., linear, square units, cubic units); justify and communicate the differences between accuracy, precision, error, and tolerance in measurement; describe how each of these can affect solutions found in problem situations. S 23.12.8	I/S	SE: 46-47, 316, 595, 601-608, 610-616, 644-648, 649-654, 655-659, 660-665, 666-670, 671-676, 688-694, 696-701, 702-706 TWE: TT 46
3.12.4 Use and interpret consumer data (e.g., amortization tables , tax tables, and compound interest charts) to make informed financial decisions related to practical applications such as budget. E 4.12.3; Ec 2.12.4; Ec 2.12.5; Ec 2.12.8; Ec 2.12.12	I/L	SE: 45, 47, 707, 710, 713, 714 #7, 813 #41, 975 #56 TWE: IE 707
3.12.5 Use relationships (e.g., proportions) and formulas (indirect measurement) to determine the measurement of unknown dimensions, angles, areas, and volumes to solve problems. S 2.12.1; S 23.12.4	I/S	SE: 77 #28, 104 #50, 168 #46, 178 #35, 179 #51, 187 #44, 192-193, 194 #12, 227 #44, 303 #24, 314-315, 345, 693 #3 & #5 TWE: IE 315 TT 345
Spatial Relationships and Geometry		
Content Standard 4.0: <i>To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will identify, represent, explain, verify, and apply spatial relationships and geometric properties.</i>		
4.12.1 Identify and use the properties of polygons (including interior and exterior angles) and elements of circles (e.g., angles, arcs, chords , secants and tangents) to solve practical problems. H 3.12.4	I/S	SE: 36 #31, 93-94, 302, 345-348, 549, 623-629 TWE: IE 346

CONTENT STANDARDS		PAGE REFERENCES
4.12.5 Use coordinate geometry to graph linear equations, determine slopes of lines, identify parallel and perpendicular lines and find possible solutions to sets of equations; use algebraic techniques to solve problems determined by geometric relationships. H 5.12.1	I/S	SE: 20-25, 67-72, 272, 273 #3, 615-621, 688 #11-#13 TWE: IE 21-22, 68 AN 618 MC 623
4.12.6 Use complementary and supplementary angles, congruent angles, vertical angles, angles formed when parallel lines are cut by a transversal, and angles in polygons to solve practical problems. H 3.12.4	W/S	SE: 302 #3, 308-311, 314 ex 1, 316-317 TWE: IE 308, 314
4.12.7 Apply the Pythagorean Theorem, its converse , properties of special right triangles, and right triangle trigonometry to solve practical problems. H 3.12.4	I/S	SE: 286, 291, 294, 306, 327, 340, 423, 489, 493, 505, 586, 615-616, 632 TWE: TT 423
4.12.8 Use tools, technology, and models to sketch, draw, and construct geometric figures in order to solve problems and to demonstrate the properties of geometric figures.	W/L	SE: 36 #11 & #31, 93-94, 302, 345-348, 549, 623-629 TWE: IE 346
4.12.9 Construct, justify and defend mathematical conclusions using logical, sequential, deductive reasoning supported by established mathematical principles. E 10.12.4	E/S	SE: <i>Communicating Mathematics</i> 92, 115, 239-240, 287, 308, 496, 627 TWE: A 235, 290, 334
Data Analysis		
Content Standard 5.0: To solve problems, communicate, reason, and make connections within and beyond the field of mathematics, students will collect, organize, display, interpret, and analyze data to determine statistical relationships and probability projections.		
5.12.1 Use calculators and computers to create and manipulate tables, graphs, and matrices to communicate statistical information; use the shape of graphs of normal distributions to compare and analyze information. G 3.12.4; G 4.12.1; G 7.12.3; H 2.12.2; H 2.12.3; S 22.12.2	I/L	SE: 925, 927-932, 935, 936, 975 #54 <i>Graphing Calculator Investigation</i> 926 TWE: AN 929 IE 919, 920, 921, 928, 929 ML 927
5.12.2 Design, conduct, analyze, and communicate the results of multi-stage probability experiments. H 5.12.1	I/L	SE: 876-877, 878-879, 924 #15 <i>Graphing Calculator Exploration</i> 877 TWE: AN 877

CONTENT STANDARDS	PAGE REFERENCES
<p>5.12.3 Distinguish between and apply permutations and combinations using a variety of methods, including The Fundamental Counting Principle. H 5.12.1</p>	<p>W/L SE: 837-845, 846-850, 882, 885 #48-#49 TWE: MC 846, 852</p>
<p>5.12.4 Select and use the measures of central tendency such as mean, median, mode and variability including range, distribution and possible outliers that are appropriate for given situations. G 7.12.4; S 20.12.4</p>	<p>E/S SE: 897-907, 934 TWE: AN 902 IE 899, 900, 901 MC 908</p>
<p>5.12.5 Analyze the validity of statistical conclusions noting various sources of bias, misuse, and abuse of data caused by a wide variety of factors including choices of scale, probability versus odds, inappropriate uses of measures of central tendency, inaccurate curve fitting and inappropriate uses of controls or sample groups. S 19.12.1; S 21.12.2; S 21.12.3; S 23.12.6</p>	<p>E/S SE: 927-932 TWE: AN 929 IE 928, 929 ML 927</p>
<p>5.12.6 Design, construct, analyze, and select an appropriate type of graph to represent data to communicate the results of statistical experiments (e.g., write a survey question and analyze and communicate the findings). S 22.12.2</p>	<p>I/L SE: 889-895 TWE: A 896 AN 891 MC 897 ML 889</p>
Problem Solving	
<p>Process Standard 6.0: <i>Students will develop their ability to solve problems by engaging in developmentally appropriate problem-solving opportunities in which there is a need to use various approaches to investigate and understand mathematical concepts in order to: formulate their own problems; find solutions to problems from everyday situations; develop and apply strategies to solve a wide variety of problems; and integrate mathematical reasoning, communication and connections.</i></p>	
<p>6.1 Select, modify, develop, and apply strategies to solve a variety of mathematical and practical problems and to investigate and understand mathematical concepts. S 1.2.3; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.2; S 1.12.4; S 2.12.1; S 3.2.3; S 10.5.2; S 14.8.6; S 19.12.2; S 21.3.1</p>	<p>E/S SE: 35, 107-111, 112-118, 159-168, 299-304, 436 #45, 621 #36, 837-845 TWE: IE 107-111, 300-301</p>
<p>6.2 Apply previous experience and knowledge to new problem-solving situations.</p>	<p>E/S SE: 35, 107-111, 112-118, 146-151, 299-304, 305-311, 695-702, 704-710 TWE: IE 113-114, 300-301</p>

CONTENT STANDARDS		PAGE REFERENCES
6.5 Verify, interpret, and evaluate results with respect to the original problem situation, determining an efficient strategy for the given situation. S 21.5.3; S 21.12.3	E/S	SE: 107-111, 112-118, 146-151, 251-256, 299-304, 313-318, 327-332 TWE: IE 113-114, 252-253, 300-310
6.7 Apply multi-step, integrated, mathematical problem-solving strategies, persisting until a solution is found or until it is clear that no solution exists. S 19.12.2	E/S	SE: 67-72, 73-77, 112-118, 213-220, 251-256 TWE: IE 68-69, 74-75, 214-216 MC 73, 78
6.9 Generalize solutions and strategies from earlier problems to new problem situations.	E/L	SE: 35, 107-111, 112-118, 146-151, 299-304, 305-311, 695-702, 704-210 TWE: IE 113-114, 300-301
6.10 Interpret and solve a variety of mathematical problems by paraphrasing, identifying necessary and extraneous information, selecting and justifying efficient methods and/or strategies, and ensuring the answer is reasonable.	E/S	SE: 54-56, 69-72, 112-118, 190-195, 299-304 TWE: IE 54, 69, 113-114, 190-192, 300-301
6.11 Apply combinations of proven strategies and previous knowledge to solve non-routine problems.	E/L	SE: 35, 38-44, 73-77, 112-118, 146-151, 236-242, 258-264 TWE: IE 113-114, 147-148, 259-260
6.13 Use technology, including calculators, to solve problems and verify solutions. S 24.5.5; S 24.8.5	E/L	SE: A2-A25 <i>Graphing Calculator Exploration</i> 69, 106, 265-266, 323, 404, 512, 665, 738-739, 926 TWE: UC 126, 204
6.14 Use technology, including calculators, to investigate, define, and describe quantitative relationships such as patterns and functions. G 7.12.3; S 1.5.1; S 1.12.2; S 1.12.4; S 14.8.6; S 24.5.5; S 24.8.5	E/L	SE: 166 #26-#31, 172-174, 177 #19-#24, 813 #40 <i>Graphing Calculator Exploration</i> 169-170 TWE: UC 126

CONTENT STANDARDS	PAGE REFERENCES
Mathematical Communication	
Process Standard 7.0: Students will develop their ability to communicate mathematically by solving problems in which there is a need to obtain information from the real world through reading, listening, and observing in order to: translate this information into a mathematical language and symbols; process this information mathematically; and present results in written, oral and visual formats.	
7.1 Discuss and exchange ideas about mathematics as a part of learning. E 10.2.3; E 10.3.3; E 10.5.3; E 10.3.1; E 10.5.1; E 10.12.1; S 23.5.2	E/L SE: <i>Communicating Mathematics</i> 17, 92, 133, 209, 247, 301-302, 348, 427, 539, 714
7.2 Use inquiry techniques (e.g., discussion, questioning, research, data gathering) to solve mathematical problems. E 4.2.3; E 10.2.2; E 10.3.2; E 10.5.2; E 10.8.2; E 11.2.1; E 11.3.1; E 11.5.1; E 11.8.1; E 11.12.1; E 11.2.2; S 1.5.1; S 1.8.1; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 21.3.1	E/L SE: 67-72, 107-111, 112-118, 127-135, 137-145, 205-212, 258-264 TWE: IE 128, 130-132, 138-141
7.3 Read expository text to learn about mathematics. E 1.8.3; E 1.12.3; E 2.12.3; E 4.8.1; E 4.8.2; E 4.8.3	I/L SE: <i>History of Mathematics</i> 97, 319, 367, 462, 534, 969 TWE: MM 97, 319, 367, 462
7.6 Interpret and solve word problems without the necessity of key words or phrases.	E/S SE: 32-37, 141, 146-151, 209-211, 313-317 TWE: IE 33-35, 141, 148, 208, 313-314
7.9 Model and explain mathematical relationships using oral, written, graphical, and algebraic methods. E 5.8.1; E 5.8.2; E 6.8.2; E 11.8.5; E 11.12.5; S 1.12.2; S 1.12.4; S 14.8.6; S 20.12.1; S 22.8.2; S 22.12.2	E/S SE: <i>Communicating Mathematics</i> 92, 115, 239-240, 287, 308, 347-348, 714 TWE: A 235, 290, 334
7.10 Evaluate the effectiveness of written and oral presentations of mathematics. S 21.5.3; S 23.5.2	I/L SE: <i>Communicating Mathematics</i> 92, 115, 226, 239-240, 308, 316, 383, 410, 453, 496
7.11 Make conjectures and present arguments in discussions of mathematical ideas. S 21.5.3; S 23.5.3	E/L SE: <i>Communicating Mathematics</i> 92, 115, 239-240, 287, 308, 347-348, 714 TWE: A 235, 290, 334
7.14 Explain and evaluate thinking about mathematical ideas and solutions based on the role of definitions, properties, common rules, and symbols in solving problems.	I SE: <i>Graphing Calculator Exploration</i> 87, 106, 169-170, 404, 446-447, 512, 738-739, 949-950 TWE: A 87, 106, 739

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7.15 Use everyday language to explain thinking about strategies and solutions to mathematical problems. S 21.5.3; S 23.5.3	E/L	SE: <i>Communicating Mathematics</i> 247 #1, 287 #1, 330 #3, 373 #4, 490 #3, 649 #4, 700 #2 TWE: A 377, 622, 652
7.16 Express mathematical ideas and use them to define, compare, and solve problems orally and in writing.	E/S	SE: <i>Communicating Mathematics</i> 92, 115, 239-240, 287, 308, 347-348, 714 TWE: A 235, 290, 334
7.17 Use mathematical notation to communicate and explain mathematical situations. S 21.2.1	E/L	SE: <i>Communicating Mathematics</i> 17, 92, 133, 165, 280, 427, 539, 722, 730 TWE: PA 17
Mathematical Reasoning		
Process Standard 8.0: <i>Students will develop their ability to reason mathematically by solving problems in which there is a need to investigate significant mathematical ideas and construct their own learning in all content areas in order to justify their thinking; reinforce and extend their logical reasoning abilities; reflect on and clarify their own thinking; and ask questions to extend their thinking.</i>		
8.3 Construct, justify, and defend mathematical conclusions using logical arguments, in situations related to mathematics, science, and technology. E 10.12.4; G 7.12.4; S 1.8.1; S 1.8.4; S 1.12.4; S 14.8.6	I/L	SE: 94 #25, 510 #40, 617-621, 724 #61, 822-828, 832 #51-#53 TWE: IE 617-618, 823-825 MC 623
8.4 Use patterns and relationships to analyze mathematical situations; draw logical conclusions about mathematical problems. Ec 3.8.2; Ec 3.8.3; Ec 9.8.4; Ec 3.12.1; Ec 3.12.2; Ec 3.12.3; Ec 3.12.4; Ec 6.12.6; G 7.12.4; S 17.3.2	E/S	SE: 16-18, 759-765, 766-773, 774-783 TWE: IE 16, 762
8.5 Follow a logical argument and judge its validity. E 4.8.4; E 4.12.4	E/L	SE: 94 #25, 510 #40, 724 #61, 822-828, 832 #51-#53 <i>You Decide</i> 226, 240, 410, 627 TWE: IE 823-825
8.7 Recognize and apply deductive and inductive reasoning in both concrete and abstract contexts.	E/S	SE: 94 #25, 510 #40, 724 #61, 759-763, 822-828, 832 #51-#53 TWE: IE 760, 823-825
8.8 Ask questions to reflect on, clarify, and extend thinking.	E/L	SE: <i>Communicating Mathematics</i> 261 #2, 287 #1, 427, 452, 577 #3-#4, 619 #1, 700 #2 TWE: A 455
8.9 Review and refine the assumptions and steps used to derive conclusions in mathematical arguments.	I/L	SE: <i>Communicating Mathematics</i> 9 #4, 48 #4, 109 #2, 134 #5, 240 #4, 383 #5, 410 #5, 453 #4-#5, 637 #5, 700 #3

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8.10 Construct valid arguments; make and test conjectures about algebraic and geometric properties based on mathematical principles. E 10.12.4	I/L	SE: 94 #25, 510 #40, 617-621, 724 #61, 822-828, 832 #51-#53 <i>You Decide</i> 627 TWE: IE 617-618, 823-825 MC 623
8.11 Determine relevant, irrelevant, and/or sufficient information to solve mathematical problems.	E/S	SE: 112-118, 189-196, 299-304, 305-311, 313-318, 320-326 TWE: IE 114, 190, 300-301, 307
Mathematical Connections		
Process Standard 9.0: <i>Students will develop the ability to make mathematical connections by solving problems in which there is a need to view mathematics as an integrated whole, identifying relationships between context strands, and integrating mathematics with other disciplines, allowing the flexibility to approach problems in a variety of ways within and beyond the field of mathematics.</i>		
9.1 Link new concepts to prior knowledge.	E/L	SE: <i>Look Back</i> 146, 155, 345, 395, 437, 464, 574, 663 TWE: PS 569
9.2 Use mathematical ideas from one area of mathematics to explain an idea from another area of mathematics.	E/S	SE: 38-44, 104 #53, 210 #14, 249 #43, 316 #25-#27, 475 #28, 621 #33, 669 #49, 845 #52, 961-968
9.3 Use models to explain the relationship of concepts to procedures. S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 20.5.1	E/S	TWE: A 25, 87, 111, 264, 318, 445, 542, 592, 684, 732, 880, 925
9.4 Use the connections among mathematical topics to develop multiple approaches to problems. S 20.8.1	I/L	SE: 20-25, 67-72, 88-95, 181, 189-196, 213-220, 222-228 TWE: IE 214-216, 224-225 MC 222
9.6 Use and analyze the connections between Mathematics and other disciplines. Ec 2.8.2; Ec 2.12.4; Ec 2.12.8; H 2.8.3; H 2.12.3; S 2.12.1; S 14.12.5	I/L	SE: 11 #52 & #54-#55, 18 #28 & #30-#31, 135 #38 & #41 & #43, 242 #37 & #40, 349 #55, 410 #13, 435 #43, 464, 468 #33, 500-501 TWE: IE 464, 501
9.7 Apply mathematical thinking and modeling to solve problems that arise in other disciplines (e.g., rhythm in music and motion in science). S 1.5.1; S 1.8.1; S 1.12.2; S 1.8.4; S 1.12.4; S 10.5.2; S 14.8.6; S 19.12.2	E/L	SE: 11 #52 & #54-#55, 18 #28 & #30-#31, 135 #38 & #41 & #43, 242 #37 & #40, 349 #55, 410 #13, 435 #43, 464, 468 #33, 500-501 TWE: IE 464, 501

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9.8 Identify, explain, and use mathematics in everyday life. Ec 2.3.2; Ec 2.12.12; Ec 5.2.1; Ec 5.3.1; S 24.12.2	I/S	SE: 43 #8, 78, 79, 116 #12, 145 #45, 258, 260, 519 #35, 691 #63 TWE: AN 7 IE 79, 260

Codes Used for TWE Pages

A	Assess
AN	Addressing Individual Needs
IE	In-Class Examples
MC	5-Minute Check
ML	Motivating the Lesson
MM	More About the Mathematicians
PA	Practice/Apply
PS	Prerequisite Skills
TT	Teaching Tip
UC	Using a Graphing Calculator