



MathMatters 3

An Integrated Program

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STANDARDS	PAGE REFERENCES
<p>Standard A--Mathematical Processes</p>	
<p>By the end of grade twelve, students will:</p>	
<p>A.12.1 Use reason and logic to</p> <ul style="list-style-type: none"> • evaluate information • perceive patterns • identify relationships • formulate questions, pose problems, and make and test conjectures • pursue ideas that lead to further understanding and deeper insight 	<p>Student Edition: 124-127, 132 #1-#8, 138-139, 142 #28-#29, 143 #15, 144 #7</p> <p>Annotated Teacher Edition: CE 125, 139; ETL 127; FG 124, 125, GS 124; QA 126</p> <p>Teacher Resources: <i>Technology Activities 7</i></p>
<p>A.12.2 Communicate logical arguments and clearly show</p> <ul style="list-style-type: none"> • why a result does or does not make sense • why the reasoning is or is not valid • an understanding of the difference between examples that support a conjecture and a proof of the conjecture 	<p>Student Edition: 69 #24, 74 #8, 107 #20, 121 #20, 134-137, 162 #9, 215 #17, 247 #47, 340 #10, 361 #28, 547 #24, 630 #6</p> <p>Annotated Teacher Edition: AA 135; QA 136; TT 134</p> <p>Teacher Resources: <i>Technology Activities 17</i></p>

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<p>A.12.3 Analyze non-routine* problems and arrive at solutions by various means, including models* and simulations, often starting with provisional conjectures and progressing, directly or indirectly, to a solution, justification, or counter-example</p>	<p>Student Edition: 128 ex 1, 130 #7-#10, 388-389, 478, 492 #2, 500 #15, 534 #1, 536 #1-#3</p> <p>Annotated Teacher Edition: CE 389; TT 388</p> <p>Teacher Resources: <i>Technology Activities 53</i></p>
<p>A.12.4 Develop effective oral and written presentations employing correct mathematical terminology, notation, symbols, and conventions for mathematical arguments and display of data</p>	<p>Student Edition: 13 #30, 19 #32, 22 #11, 28 #16, 31 #5, 37 #44, 59 #34, 79 #35, 85 #16, 106 #4, 117 #30-#34, 157 #12, 163 #18, 167 #23, 175 #29</p>
<p>A.12.5 Organize work and present mathematical procedures and results clearly, systematically, succinctly, and correctly</p>	<p>Student Edition: 13 #30, 19 #32, 22 #11, 28 #16, 31 #5, 37 #44, 59 #34, 79 #35, 85 #16, 106 #4, 117 #30-#34, 157 #12, 163 #18, 167 #23, 175 #29</p>
<p>A.12.6 Read and understand</p> <ul style="list-style-type: none"> • mathematical texts and other instructional materials • writing about mathematics (e.g., articles in journals)mathematical ideas as they are used in other contexts 	<p>Student Edition: <i>Reading Math</i> 10, 21, 56, 66, 105, 110, 118, 129, 134, 155, 160, 172, 206, 221, 275</p>
<p>Standard B--Number Operations and Relationships</p>	
<p>By the end of grade twelve, students will:</p>	
<p>B.12.1 Use complex counting procedures such as union and intersection of sets and arrangements (permutations* and combinations*) to solve problems</p>	<p>Student Edition: 16-19, 24 #1-#19, 25 #44-#49, 402-405, 410 #1-#24, 411 #37-#40, 417 #29-#31, 419 #6, 421 #18</p> <p>Annotated Teacher Edition: AA 405; CE 403; ETL 402, 403; QA 404; TT 404</p>
<p>B.12.2 Compare real numbers using</p> <ul style="list-style-type: none"> • order relations (>,<) and transitivity* • ordinal scales including logarithmic (e.g., Richter, pH rating) • arithmetic differences • ratios, proportions, percents, rates of change 	<p>Student Edition: 202-205, 210 #17, 211 #41, 234 #11-#13, 298 #20</p> <p>Annotated Teacher Edition: AA 203; ET 202, 204, 205, 299; QA 204</p>
<p>B.12.3 Perform and explain operations on real numbers (add, subtract, multiply, divide, raise to a power, extract a root, take opposites and reciprocals, determine absolute value)</p>	<p>Student Edition: 20-23, 24 #20-#33, 25 #51-#56, 26-29, 32 #1-#18, 33 #40-#45, 43 #28-#33, 45 #15-#22</p> <p>Annotated Teacher Edition: CE 21, 27; DI 20; ET 29; FG 26, 27; QA 22, 28</p>

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<p>B.12.4 In problem-solving situations involving the application of different number systems (natural, integers, rational*, real*) select and use appropriate</p> <ul style="list-style-type: none"> • computational procedures • properties (e.g., commutativity*, associativity*, inverses*) • modes of representation (e.g., rationals as repeating decimals, indicated roots as fractional exponents) 	<p>Student Edition: 5 #41-#52, 30-31, 326-327, 382 #1-#35, 502-503, 659 #1-#27, 661 #1-#16 <i>Check Understanding 27</i> <i>Reading Math 21</i> Annotated Teacher Edition: CE 383</p>
<p>B.12.5 Create and critically evaluate numerical arguments presented in a variety of classroom and real-world situations (e.g., political, economic, scientific, social)</p>	<p>Student Edition: 69 #24, 74 #8, 107 #20, 121 #20, 134-137, 162 #9, 215 #17, 247 #47, 340 #10, 361 #28, 547 #24, 630 #6</p>
<p>B.12.6 Routinely assess the acceptable limits of error when</p> <ul style="list-style-type: none"> • evaluating strategies • testing the reasonableness of results • using technology to carry out computations 	<p>Student Edition: 69 #24, 74 #8, 107 #20, 121 #20, 134-137, 162 #9, 215 #17, 247 #47, 340 #10, 361 #28, 547 #24, 630 #6</p>
<p>Standard C--Geometry</p>	
<p>By the end of grade twelve, students will:</p>	
<p>C.12.1 Identify, describe, and analyze properties of figures, relationships among figures, and relationships among their parts by</p> <ul style="list-style-type: none"> • constructing physical models • drawing precisely with paper-and-pencil, hand calculators, and computer software • using appropriate transformations* (e.g., translations, rotations, reflections, enlargements) • using reason and logic 	<p>Student Edition: 118-121, 122 #15-#16, 338-341, 342-345, 346 #1-#18, 347 #19-#30, 348-351, 352-355, 356 #1-#16, 357 #17-#26, 367 #61-#64, 374 #11-#14 Annotated Teacher Edition: CE 119; ETL 119; QA 120</p>
<p>C.12.2 Use geometric models* to solve mathematical and real-world problems</p>	<p>Student Edition: 153 #13, 175 #31-#37, 177 #1-#3, 208 #13, 209 #19-#21, 211 #1-#3, 213 ex 3, 215 #27, 217 #5, 218 #15, 219 #23, 223 #16, 227 #18, 239 #23</p>

STANDARDS	PAGE REFERENCES
<p>C.12.3 Present convincing arguments by means of demonstration, informal proof, counter-examples, or any other logical means to show the truth of</p> <ul style="list-style-type: none"> statements (e.g., these two triangles are not congruent) generalizations (e.g., the Pythagorean* theorem holds for all right triangles) 	<p>Student Edition: 134-137, 142 #32, 143 #14, 160-163, 170-171, 176 #1-#10, 187 #26, 193 #27-#29, 195 #9, 196 #7</p> <p>Annotated Teacher Edition: AA 135; CE 171; QA 162, 171; TT 134</p>
<p>C.12.4 Use the two-dimensional rectangular coordinate system* and algebraic procedures to describe and characterize geometric properties and relationships such as slope*, intercepts*, parallelism, and perpendicularity</p>	<p>Student Edition: 244-247, 248-251, 252 #37-#45, 253 #56-#61, 263 #44-#53, 273 #42-#46, 281 #35-#43, 287 #16-#20, 289 #3-#4, 290 #7</p> <p>Annotated Teacher Edition: CE 245, 249; ETL 250; QA 250</p> <p>Teacher Resources: <i>Technology Activities 33, 35, 37</i></p>
<p>C.12.5 Identify and demonstrate an understanding of the three ratios used in right-triangle trigonometry (sine, cosine, tangent)</p>	<p>Student Edition: 614-617, 622 #1-#13, 623 #23-#30, 633 #41-#46, 636 #11-#17, 639 #1-#6, 640 #8, 641 #22</p> <p>Annotated Teacher Edition: CE 615; DI 615; QA 616; TT 616</p> <p>Teacher Resources: <i>Technology Activities 79</i></p>
<p>Standard D--Measurement</p>	
<p>By the end of grade twelve, students will:</p>	
<p>D.12.1 Identify, describe, and use derived attributes* (e.g., density, speed, acceleration, pressure) to represent and solve problem situations</p>	<p>Student Edition: 204 #9, 205 #35, 210 #16</p>
<p>D.12.2 Select and use tools with appropriate degree of precision to determine measurements directly* within specified degrees of accuracy and error (tolerance)</p>	<p>Student Edition: 202, 204 #10, 237 #18</p> <p>Annotated Teacher Edition: I 202</p>

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<p>D.12.3 Determine measurements indirectly*, using</p> <ul style="list-style-type: none"> estimation proportional reasoning, including those involving squaring and cubing (e.g., reasoning that areas of circles are proportional to the squares of their radii) techniques of algebra, geometry, and right triangle trigonometry formulas in applications (e.g., for compound interest, distance formula) geometric formulas to derive lengths, areas, or volumes of shapes and objects (e.g., cones, parallelograms, cylinders, pyramids) geometric relationships and properties of circles and polygons (e.g., size of central angles, area of a sector of a circle) conversion constants to relate measures in one system to another (e.g., meters to feet, dollars to Deutschmarks) 	<p>Student Edition: 296-299, 326-327, 330 #38-#39, 331 #17, 333 #23, 620 #17, 621 #19, 623 #1, 637 #21-#23, 639 #11, 640 #5</p> <p>Annotated Teacher Edition: AA 327; CE 327; QA 327; TT 297</p>
<p>Standard E--Statistics and Probability</p>	
<p>By the end of grade twelve, students will:</p>	
<p>E.12.1 Work with data in the context of real-world situations by</p> <ul style="list-style-type: none"> formulating hypotheses that lead to collection and analysis of one- and two-variable data designing a data collection plan that considers random sampling, control groups, the role of assumptions, etc. conducting an investigation based on that plan using technology to generate displays, summary statistics*, and presentations 	<p>Student Edition: 85 #16, 89 #20 <i>Chapter Investigation</i> 49, 96</p> <p>Annotated Teacher Edition: AA 97; GS 412; T 96</p> <p>Teacher Resources: <i>Technology Activities 11</i></p>
<p>E.12.2 Organize and display data from statistical investigations using</p> <ul style="list-style-type: none"> frequency distributions percentiles*, quartiles, deciles line of best fit* (estimated regression line) matrices 	<p>Student Edition: 84 #4, 85 #8, 87 ex 3, 90 #7, 96 #48, 97 #15, 407 ex 2</p> <p>Annotated Teacher Edition: DI 82; QA 84</p> <p>Teacher Resources: <i>Technology Activities 11, 57</i></p>

STANDARDS	PAGE REFERENCES
<p>E.12.3 Interpret and analyze information from organized and displayed data when given</p> <ul style="list-style-type: none"> measures of dispersion*, including standard deviation and variance measures of reliability measures of correlation* 	<p>Student Edition: 412-415, 418 #37-#40, 419 #11</p> <p>Annotated Teacher Edition: CE 413; ETL 413; FG 415; QA 414; TT 412, 414</p> <p>Teacher Resources: <i>Technology Activities 57</i></p>
<p>E.12.4 Analyze, evaluate, and critique the methods and conclusions of statistical experiments reported in journals, magazines, news media, advertising, etc.</p>	<p>Student Edition: 86, 92-93, 96 #52-#54</p> <p>Annotated Teacher Edition: CE 93; DA 49; ETL 93; GS 82</p> <p>Teacher Resources: <i>Technology Activities 57</i></p>
<p>E.12.5 Determine the likelihood of occurrence of complex events by</p> <ul style="list-style-type: none"> using a variety of strategies (e.g., combinations*) to identify possible outcomes conducting an experiment designing and conducting simulations* applying theoretical probability 	<p>Student Edition: 384-387, 388-389, 390 #1-#30, 391 #40, 392-395, 396-399, 400 #1-#29, 416 #18-#20</p> <p>Annotated Teacher Edition: CE 385, 389; ETL 386, 387; FG 385; PE 384; TT 388, 389</p>
<p>Standard F--Algebraic Relationships</p>	
<p>By the end of grade twelve, students will:</p>	
<p>F.12.1 Analyze and generalize patterns of change (e.g., direct and inverse variation) and numerical sequences, and then represent them with algebraic expressions and equations</p>	<p>Student Edition: 52-55, 580-583, 584-587, 588 #1-#24, 605 #27-#33, 607 #15-#19, 609 #21</p> <p>Annotated Teacher Edition: CE 53; ETL 580; FG 52; QA 54</p> <p>Teacher Resources: <i>Technology Activities 7, 77</i></p>

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<p>F.12.2 Use mathematical functions* (e.g., linear*, exponential*, quadratic*, power) in a variety of ways, including</p> <ul style="list-style-type: none"> • recognizing that a variety of mathematical and real-world phenomena can be modeled* by the same type of function • translating different forms of representing them (e.g., tables, graphs, functional notation*, formulas) • describing the relationships among variable quantities in a problem • using appropriate technology to interpret properties of their graphical representations (e.g., intercepts, slopes, rates of change, changes in rates of change, maximum*, minimum*) 	<p>Student Edition: 62-65, 70 #1-#9, 81 #69-#76, 91 #32-#37, 95 #21-#23, 594-597, 598 #16-#28, 599 #54-#56, 606 #37-#40, 607 #26</p> <p>Annotated Teacher Edition: DI 595; FG 63; QA 64, 596; TT 594</p>
<p>F.12.3 Solve linear and quadratic equations, linear inequalities, and systems of linear equations and inequalities</p> <ul style="list-style-type: none"> • numerically • graphically, including use of appropriate technology • symbolically, including use of the quadratic formula 	<p>Student Edition: 66-69, 70 #19-#51, 71 #63-#65, 72-75, 76-79, 80 #1-#24, 81 #71-#79, 89 #27-#35, 91 #38-#55, 95 #27-#47, 97 #6-#11, 98 #6, 264-267, 268-271, 272 #1-#35</p>
<p>F.12.4 Model and solve a variety of mathematical and real-world problems by using algebraic expressions, equations, and inequalities</p>	<p>Student Edition: 51 #29-#35, 63 ex 3, 64 #5, 68 #14, 69 #25, 74 ex 4, 75 #33, 79 #25-#26, 99 #21, 591 ex 2, 592 #20</p>