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To the

Florida State Standards for Pre-Calculus Honors - 1202340

CORRELATION
FLORIDA DEPARTMENT OF EDUCATION
INSTRUCTIONAL MATERIALS CORRELATION
COURSE STANDARDS/BENCHMARKS

SUBJECT: Mathematics
GRADE LEVEL: 9-12
COURSE TITLE: Pre-Calculus Honors
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SUBMISSION TITLE: MyMathLab for School
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BENCHMARK CODE	BENCHMARK	LESSONS WHERE BENCHMARK IS DIRECTLY ADDRESSED IN-DEPTH IN MAJOR TOOL (Include page numbers of lesson, a link to lesson, or other identifier for easy lookup by reviewers.)
LACC.910.RST.1.3:	Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.	**SE/TE:**142-144, 241-242, 356
LACC.910.RST.2.4:	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.	**SE/TE:** 2-5, 13, 21, 49, 51, 80, 84-87, 93, 100-101, 111, 119, 121, 130, 134, 187, 199, 210, 321, 329, 653-655, 678, 738, 74, 750, 757
LACC.910.RST.3.7:	Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words.	**SE/TE:** 35, 39 (#69-#71), 65, 71, 97 (#79), 142-144, 171 (#58-#60), 243, 589, 600

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LACC.910.SL.1.1:	Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively. a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas. b. Work with peers to set rules for collegial discussions and decision-making (e.g., informal consensus, taking votes on key issues, presentation of alternate views), clear goals and deadlines, and individual roles as needed. c. Propel conversations by posing and responding to questions that relate the current discussion to broader themes or larger ideas; actively incorporate others into the discussion; and clarify, verify, or challenge ideas and conclusions. d. Respond thoughtfully to diverse perspectives, summarize points of agreement and disagreement, and, when warranted, qualify or justify their own views and understanding and make new connections in light of the evidence and reasoning presented.	The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 151 (#52), 196 (#86), 303 (#67), 336 (#66), 360 (#91-#92), 427 (#68) **a. SE/TE:** 151 (#52), 196 (#86), 303 (#67), 336 (#66), 360 (#91-#92) **b.** The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 427 (#68) **c.** The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 427 (#68) **d.** The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 151 (#52-#53), 427 (#68)
LACC.910.SL.1.2:	Integrate multiple sources of information presented in diverse media or formats (e.g., visually, quantitatively, orally) evaluating the credibility and accuracy of each source.	The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 427 (#68)

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LACC.910.SL.1.3:	Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, identifying any fallacious reasoning or exaggerated or distorted evidence.	The opportunity to address this standard is available. See the following: **SE/TE:** 76 (#25-#28), 427 (#68)
LACC.910.SL.2.4:	Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.	**SE/TE:** 151 (#52), 196 (#86), 303 (#67), 336 (#66), 360 (#91-#92)
MA.912.C.1.13:	Understand and apply the Extreme Value Theorem: If f(x) is continuous over a closed interval, then f has a maximum and a minimum on the interval.	**SE/TE:** 98 (#87)
MA.912.C.1.2:	Find limits by substitution.	**SE/TE:** 758, 763

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LACC.910.WHST.1.1:	Write arguments focused on *discipline-specific content.*	The opportunity to address this standard is available. See the following: **SE/TE:** 10 (#65-#66), 53 (#51-#52), 78 (#61), 79 (#63), 97 (#82, #84), 127 (#45-#48), 150 (#44-#50), 151 (#51-#52), 206 (#74-#79), 244 (#73), 368 (#64), 691 (#36)
	a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.	**a. SE/TE:** 78 (#61), 79 (#63), 97 (#84), 127 (#45-#48), 691 (#36)
	b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.	**b. SE/TE:** 150 (#44-#50)
	c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.	**c. SE/TE:** 151 (#51-#52)
	d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.	**d.** The opportunity to address this standard is available. See the following: **SE/TE:** 10 (#65-#66), 53 (#51-#52), 206 (#74-#79)
	e. Provide a concluding statement or section that follows from or supports the argument presented.	**e.** The opportunity to address this standard is available. See the following: **SE/TE:** 97 (#82), 244 (#73), 368 (#64)

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LACC.910.WHST.2.4:	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.	**SE/TE:** 96 (#70), 138 (#56), 150 (#49)
LACC.910.WHST.3.9:	Draw evidence from informational texts to support analysis, reflection, and research.	The opportunity to address this standard is available. See the following: **SE/TE:** 96 (#70), 138 (#56), 150 (#49)
MA.912.C.1.1:	Understand the concept of limit and estimate limits from graphs and tables of values.	**SE/TE:** 85, 92-93, 175-176, 179, 218, 220, 222-224, 255, 257, 259
MA.912.C.1.10:	Decide if a function is continuous at a point.	**SE/TE:** 84-85
MA.912.C.1.11:	Find the types of discontinuities of a function.	**SE/TE:** 84-86, 102, 758-759
MA.912.C.1.12:	Understand and use the Intermediate Value Theorem on a function over a closed interval.	**SE/TE:** 97 (#84), 190
MA.912.C.1.3:	Find limits of sums, differences, products, and quotients.	**SE/TE:** 756-758, 763-764
MA.912.C.1.4:	Find limits of rational functions that are undefined at a point.	**SE/TE:** 222-224
MA.912.C.1.5:	Find one-sided limits.	**SE/TE:** 92, 758-759, 763

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MA.912.C.1.9:	Understand continuity in terms of limits.	**SE/TE:** 85, 92-93
MACC.912.A-APR.3.4:	Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.	**SE/TE:** 785
MACC.912.A-APR.3.5:	Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.	**SE/TE:** 652-655, 656
MACC.912.A-APR.4.6:	Rewrite simple rational expressions in different forms; write a(x)/b(x) in the form q(x) + r(x)/b(x), where a(x), b(x), q(x), and r(x) are polynomials with the degree of r(x) less than the degree of b(x), using inspection, long division, or, for the more complicated examples, a computer algebra system.	**SE/TE:** 221, 223, 226
MACC.912.A-APR.4.7:	Understand that rational expressions form a system analogous to the rational numbers, closed under addition, subtraction, multiplication, and division by a nonzero rational expression; add, subtract, multiply, and divide rational expressions.	**SE/TE:** 792-793, 795
MACC.912.F-TF.2.7:	Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.	**SE/TE:** 386

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MACC.912.F-TF.3.8:	Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.	**SE/TE:** 405, 407-408, 410-411
MACC.912.F-TF.3.9:	Prove the addition and subtraction formulas for sine, cosine, and tangent and use them to solve problems.	**SE/TE:** 421-424, 425-426
MACC.912.F-BF.1.1:	Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. b. Combine standard function types using arithmetic operations. *For example, build a function that models the temperature of a cooling body by adding a constant function to a decaying exponential, and relate these functions to the model.* c. Compose functions. *For example, if T(y) is the temperature in the atmosphere as a function of height, and h(t) is the height of a weather balloon as a function of time, then T(h(t)) is the temperature at the location of the weather balloon as a function of time.*	**SE/TE:** 110-114, 141-144, 147, 369, 370, 371-373, 375-376, 382-384, 385-386 **a. SE/TE:** 141-144, 147 **b. SE/TE:** 110-111, 369, 371-373, 375-376 **c. SE/TE:** 111-114, 370, 375, 382-384, 385-386

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MACC.912.F-BF.2.4:	Find inverse functions. a. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. *For example, f(x) =2 x^3 or f(x) = (x+1)/(x–1) for x ≠ 1.* b. Verify by composition that one function is the inverse of another. c. Read values of an inverse function from a graph or a table, given that the function has an inverse. d. Produce an invertible function from a non-invertible function by restricting the domain.	**SE/TE:** 122-125, 126, 378 **a. SE/TE:** 122-125, 126 **b. SE/TE:** 124, 126 **c.** The opportunity to address this standard is available. See the following: **SE/TE:** 122-124 **d. SE/TE:** 124, 378
MACC.912.F-TF.1.1:	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.	**SE/TE:** 321-322
MACC.912.F-TF.1.2:	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.	**SE/TE:** 344-345
MACC.912.F-TF.1.3:	Use special triangles to determine geometrically the values of sine, cosine, tangent for π/3, π/4 and π/6, and use the unit circle to express the values of sine, cosine, and tangent for π–x, π+x, and 2π–x in terms of their values for x, where x is any real number.	**SE/TE:** 346, 347

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MACC.912.F-TF.1.4:	Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	**SE/TE:** 90-91, 345
MACC.912.F-TF.2.5:	Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.	**SE/TE:** 355-356, 358, 392-393, 396 (#31)
MACC.912.F-TF.2.6:	Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.	**SE/TE:** 378
MACC.912.G-GPE.1.1:	Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.	**SE/TE:** 15-16, 19
MACC.912.G-GPE.1.2:	Derive the equation of a parabola given a focus and directrix.	**SE/TE:** 581-585, 588
MACC.912.G-GPE.1.3:	Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.	**SE/TE:** 591-595, 599-600, 603-606, 609
MACC.912.G-SRT.3.8:	Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.	**SE/TE:** 334, 336-337
MACC.912.G-SRT.4.10:	Prove the Laws of Sines and Cosines and use them to solve problems.	**SE/TE:** 434, 442-443

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MACC.912.G-SRT.4.11:	Understand and apply the Law of Sines and the Law of Cosines to find unknown measurements in right and non-right triangles (e.g., surveying problems, resultant forces).	**SE/TE:** 434-438, 439-441, 443-444
MACC.912.G-SRT.4.9:	Derive the formula A = 1/2 ab sin(C) for the area of a triangle by drawing an auxiliary line from a vertex perpendicular to the opposite side.	**SE/TE:** 444, 448
MACC.912.N-CN.1.3:	Find the conjugate of a complex number; use conjugates to find moduli and quotients of complex numbers.	**SE/TE:** 51, 53
MACC.912.N-CN.2.4:	Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers), and explain why the rectangular and polar forms of a given complex number represent the same number.	**SE/TE:** 504
MACC.912.N-CN.2.5:	Represent addition, subtraction, multiplication, and conjugation of complex numbers geometrically on the complex plane; use properties of this representation for computation. For example, $(–1 + \sqrt{3}\, i)^3 = 8$ because $(–1 + \sqrt{3}\, i)$ has modulus 2 and argument 120°.	**SE/TE:** 505-509, 511
MACC.912.N-CN.3.9:	Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.	**SE/TE:** 210

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MACC.912.N-VM.1.1:	Recognize vector quantities as having both magnitude and direction. Represent vector quantities by directed line segments, and use appropriate symbols for vectors and their magnitudes (e.g., v, |v|, ||v||, $\vec{v}$).	**SE/TE:** 456-458
MACC.912.N-VM.1.2:	Find the components of a vector by subtracting the coordinates of an initial point from the coordinates of a terminal point.	**SE/TE:** 457-459
MACC.912.N-VM.1.3:	Solve problems involving velocity and other quantities that can be represented by vectors.	**SE/TE:** 461-463, 465

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MACC.912.N-VM.2.4:	Add and subtract vectors. a. Add vectors end-to-end, component-wise, and by the parallelogram rule. Understand that the magnitude of a sum of two vectors is typically not the sum of the magnitudes. b. Given two vectors in magnitude and direction form, determine the magnitude and direction of their sum. c. Understand vector subtraction **v** – **w** as **v** + (–**w**), where –**w** is the additive inverse of **w**, with the same magnitude as **w** and pointing in the opposite direction. Represent vector subtraction graphically by connecting the tips in the appropriate order, and perform vector subtraction component-wise.	**SE/TE:** 458-459, 462, 464-465 **a. SE/TE:** 458-459, 464 **b. SE/TE:** 462, 464-465 **c. SE/TE:** 464
MACC.912.N-VM.2.5:	Multiply a vector by a scalar. a. Represent scalar multiplication graphically by scaling vectors and possibly reversing their direction; perform scalar multiplication component-wise, e.g., as $c(v_x, v_y) = (cv_x, cv_y)$. b. Compute the magnitude of a scalar multiple c**v** using ||c**v**|| = |c|v. Compute the direction of c**v** knowing that when |c|v ≠ 0, the direction of c**v** is either along **v** (for c > 0) or against **v** (for c < 0).	**SE/TE:** 458, 459 **a. SE/TE:** 458 **b. SE/TE:** 459

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MACC.K12.MP.1.1:	**Make sense of problems and persevere in solving them.** Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, “Does this make sense?” They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.	**SE/TE:** 167, 231, 266, 608

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MACC.K12.MP.2.1:	**Reason abstractly and quantitatively**. Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to decontextualize-to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents-and the ability to contextualize, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.	**SE/TE:** 140-141, 167-168, 230-231

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MACC.K12.MP.3.1:	**Construct viable arguments and critique the reasoning of others.** Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and-if there is a flaw in an argument-explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.	**SE/TE:** 77 (#53), 79 (#63), 196 (#86), 691 (#36)

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MACC.K12.MP.4.1:	**Model with mathematics.** Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.	**SE/TE:** 64-68, 70-73, 140-145, 151-163, 191-192

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MACC.K12.MP.5.1:	**Use appropriate tools strategically.** Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.	**SE/TE:** 40-45, 46, 69, 71-73, 77 (#48), 190-191, 195 (#75-#80)

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MACC.K12.MP.6.1:	**Attend to precision.** Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.	**SE/TE:** 57-58, 146-147, 151 (#50), 293

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MACC.K12.MP.7.1:	**Look for and make use of structure.** Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 – 3(x – y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.	**SE/TE:** 108-109, 129-135, 136-137, 209 (#77)

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MACC.K12.MP.8.1:	**Look for and express regularity in repeated reasoning.** Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y – 2)/(x – 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x – 1)(x + 1)$, $(x – 1)(x^2 + x + 1)$, and $(x – 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.	**SE/TE:** 53 (#51), 217 (#59), 227 (#70), 273 (#57-#58), 506-507