



ADVANCED Mathematical Concepts

Precalculus
with Applications
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STANDARDS		PAGE REFERENCES
PRE-CALCULUS		
NUMBERS AND OPERATIONS		
1.	Explore and illustrate the characteristics and operations connecting sequences and series.	
a.	Express sequences and series using recursive and explicit formulas. (DOK 2)	Student Edition: 759-765, 766-773, 774-783, 794-800 Teacher Wraparound Edition: A 800; AIN 761, 770; EC 764, 799; F 766, 774, 801; ICE 760, 761, 767, 768, 769, 795, 796, 797
b.	Evaluate and apply formulas for arithmetic and geometric sequences and series. (DOK 2)	Student Edition: 759-765, 766-773, 774-783, 794-800 Teacher Wraparound Edition: A 800; AIN 761, 770; EC 764, 799; F 766, 774, 801; ICE 760, 761, 767, 768, 769, 795, 796, 797
c.	Calculate limits based on convergent and divergent series. (DOK 2)	Student Edition: 774-783, 786-793, 805 #40, 831 #22-#25 Teacher Wraparound Edition: A 783; AIN 789; F 786; FTC 775; ICE 775, 776, 777; TT 777, 778
d.	Evaluate and apply infinite geometric series. (DOK 2)	Student Edition: 774-783, 786-793, 805 #40, 831 #22-#25

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		Teacher Wraparound Edition: A 783; AIN 789; F 786; FTC 775; ICE 775, 776, 777; TT 777, 778
ALGEBRA		
2	Analyze, manipulate, and solve equations and inequalities.	
a.	Determine characteristics of graphs of parent functions (domain/range, increasing/decreasing intervals, intercepts, symmetry, end behavior, and asymptotic behavior). (DOK 2)	Student Edition: 137-145, 151 #46, 168 #41, 198 #19-#22, 705 ex 1, 708 #4, 709 #22 Teacher Wraparound Edition: A 145; AIN 141; F 146; FTC 139; ICE 138, 139, 140, 141, 705; TT 139, 182
b.	Determine horizontal, vertical, and slant asymptotes and holes of rational functions and explain how each was found. (DOK 2)	Student Edition: 180-188, 196 #42, 200 #48-#51 Teacher Wraparound Edition: A 188; EC 188; ICE 181, 182, 183, 185; TT 182
c.	Determine the domain and range of functions, including piece-wise functions. (DOK 2)	Student Edition: 5-12, 47, 48 #2, 406, 410 #4 Teacher Wraparound Edition: ICE 5, 6
d.	Determine the end behavior of polynomial functions. (DOK 2)	Student Edition: 205-212, 258-264, 265-266, 270 #54-#55 Teacher Wraparound Edition: A 212; AIN 208; ICE 208
e.	Decompose composite functions into component functions. (DOK 2)	Student Edition: 18 #32
f.	Solve exponential and logarithmic equations to include real-world applications. (DOK 2)	Student Edition: 706 ex 2, 707 ex 4, 713 ex 2, 719 ex 1-ex 2, 721 ex 5, 723 #13-#16, 729 ex 7, 730 #13-#14, 731 #40-#45, 732 #65, 734 ex 3 Teacher Wraparound Edition: A 725; F 726; ICE 706, 707, 713, 719, 721, 729, 734
g.	Find the possible rational roots using the Rational Root Theorem. (DOK 1)	Student Edition: 229-235, 242 #39, 257 #44, 269 #34-#36, 271 #58 Teacher Wraparound Edition: A 235; AIN 232; EC 235; F 236; ICE 230, 231; T 230; TT 231

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h.	Find the zeros of polynomial functions by synthetic division and the Factor Theorem. (DOK 1)	Student Edition: 222-228, 235 #5-#7, 250 #48, 268 #22-#25 Teacher Wraparound Edition: A 228; AIN 226; EC 228; F 229; ICE 223, 224, 225; TT 223, 224
i.	Graph and solve quadratic inequalities. (DOK 2)	Student Edition: 146-151, 198 #25, 504 #49 Teacher Wraparound Edition: AIN 148; ICE 148
j.	Decompose a rational function into partial fractions. (DOK 2)	Student Edition: 243-250, 257 #43 Teacher Wraparound Edition: A 250; AIN 246; EC 250; ICE 244, 245, 246; MTL 243; TT 244
GEOMETRY		
3.	Recognize, sketch, and transform graphs of functions.	
a.	Describe the attributes of graphs and the general equations of parent functions (linear, quadratic, cubic, absolute value, rational, exponential, logarithmic, square root, cube root, and greatest integer). (DOK 1)	Student Edition: 137-145, 151 #46, 168 #41, 198 #19-#22, 705 ex 1, 708 #4, 709 #22 Teacher Wraparound Edition: A 145; AIN 141; F 146; FTC 139; ICE 138, 139, 140, 141, 705; TT 139, 182
b.	Explain the effects of changing the parameters in transformations of functions. (DOK 2)	Student Edition: 138 ex 2, 139 ex 3, 140 ex 4, 142 #6-#7, 143 #20-#25, 151 #46, 198 #19-#22 Teacher Wraparound Edition: A 145; AIN 141; F 146; FTC 139; ICE 138, 139, 140; MTL 138
c.	Predict the shapes of graphs of exponential, logarithmic, rational, and piece-wise functions, and verify the prediction with and without technology. (DOK 2)	Student Edition: 137-145, 151 #46, 168 #41, 198 #19-#22, 705 ex 1, 708 #4, 709 #22 Teacher Wraparound Edition: A 145; AIN 141; F 146; FTC 139; ICE 138, 139, 140, 141, 705; TT 139, 182
d.	Relate symmetry of the behavior of even and odd functions. (DOK 2)	Student Edition: 127-136, 145 #44, 151 #47, 168 #41, 198 #11-#18

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		Teacher Wraparound Edition: A 136; AIN 132; EC 134, 145; F 137; ICE 128, 130, 131, 132; TT 128, 129, 130, 131
DATA ANALYSIS & PROBABILITY		
4.	Adapt curves to data.	
a.	Use regression methods available through technology to determine appropriate exponential and logarithmic functions that model real-life data. (DOK 3)	Student Edition: 740-748, 752 #72-#74 Teacher Wraparound Edition: EC 748; FTC 742; ICE 741, 742, 743; MTL 740; TT 743
b.	Use regression methods available through technology to determine appropriate cubic functions that model real-life data. (DOK 3)	Student Edition: 258-264, 265-266, 270 #54-#55, 283 #67 Teacher Wraparound Edition: A 264, 266; AIN 260; EC 264; ICE 259, 260
5.	Explore and apply fundamental principles of probability.	
a.	Analyze expressions in summation and factorial notation to solve problems. (DOK 2)	Student Edition: 794-800, 805 #38, 814 #44, 831 #31-#34 Teacher Wraparound Edition: A 800; AIN 796; EC 799; F 801; ICE 795, 796, 797; TT 795, 798
b.	Expand and apply the Binomial Theorem to problem-solving situations. (DOK 2)	Student Edition: 801-805, 814 #43, 821 #37, 832 #35-#40 Teacher Wraparound Edition: A 805; AIN 803; EC 805; F 806; ICE 802, 803; MTL 802; TT 802, 803