

**Algebra and Trigonometry © 2006, (Foerster)**  
**Correlated to:**  
**Utah Core Standards for Mathematics: Precalculus**  
**(Grades 9-12)**

UTAH CORE STANDARDS, MATHEMATICS, PRECALCULUS	PAGE(S) WHERE TAUGHT (If submission is not a text, cite appropriate resource(s))
<b>Standard 1 Students will acquire number sense and perform operations with real and complex numbers.</b>	
<b>Objective 1.1 Compute fluently and make reasonable estimates.</b>	
1. Add, subtract, multiply, and find the absolute value using complex numbers.	SE/TE: 192-195, 199, 518-523, 526-530, 535, 555-556
2. Add, subtract and perform scalar multiplication on vectors using a variety of techniques with or without the use of technology.	SE/TE: 900-904, 906, 907-914, 915-922, 924, 926, 927, 929
<b>Objective 1.2 Represent complex numbers and vectors in a variety of ways.</b>	
1. Represent vectors graphically and symbolically.	SE/TE: 898-906, 907-914, 915-922, 924, 926, 927, 929
2. Represent complex numbers in rectangular and polar form and convert between rectangular and polar form.	
<b>Objective 1.3 Identify relationships among complex numbers and vectors and operations involving these items.</b>	
1. Analyze properties of vectors and their effects on vector operations.	SE/TE: 898-906, 907-914, 915-922, 924, 926, 927, 929
2. Analyze properties of complex numbers and their effects on operations in rectangular and polar form.	SE/TE: 0-3, 188-195, 199, 517-523, 526-530, 535, 555-556
3. Develop and use the limit definition of e.	Related material: SE/TE: 285, 312, 589-597, 599-612
<b>Standard 2 Students will represent and analyze mathematical situations and properties using patterns, relations, functions, and algebraic symbols.</b>	
<b>Objective 2.1 Use patterns, relations, and functions to represent mathematical situations.</b>	
1. Identify the domain, range, and other attributes of families of functions and their inverses, i.e., exponential, polynomial, rational, logarithmic, piece-wise, and trigonometric.	SE/TE: 54-57, 60, 65-69, 70, 73-74, 75-82, 83-85, 87-93, 94-97, 99-101, 106, 115-116, 174-175, 176, 178-181, 185, 196-199, 200-204, 225, 227, 229-230, 231, 260, 287-288, 290-295, 296-300, 318, 323, 324-328, 370-377, 383-387, 389-391, 409-410, 413, 414-416, 432-435, 442-444, 453-455, 456-458, 514-515, 533-544, 545-549, 555-558, 710-711, 717-720, 729, 735-742, 743-749, 750-756, 757-767, 768-772, 776-777, 787, 800-806, 807-813, 814-824, 825-831, 832-837, 838-841, 842-844, 845-850, 907-914, 924, 926, 927

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2. Simplify expressions or solve equations using a variety of approaches and techniques, e.g., polynomial long division, Rational Root Theorem, logarithms, and partial fractions.	SE/TE: 6-8, 10-15, 18-20, 21-26, 27-32, 34, 36-38, 40-43, 46-47, 51-52, 87, 95-105, 106-107, 111-112, 113-119, 120-126, 127-132, 134, 136, 139-142, 143-145, 146-149, 150-152, 154-155, 157-168, 169-172, 176-177, 181-188, 192-194, 195-199, 205-220, 221-223, 225, 232-235, 236-241, 242, 244-248, 249-252, 255-259, 261-263, 264-268, 270-274, 275-279, 281-282, 283-285, 287-289, 297-300, 301-317, 318-321, 329-330, 332-335, 337-340, 343-347, 349-350, 352-355, 356-364, 365-370, 378-383, 386-405, 406-411, 417-424, 425-432, 433-442, 444-452, 453-455, 458-459, 464, 478-479, 484-485, 493-494, 497-506, 518-523, 524-530, 531-544, 546-549, 550-554, 555-558, 561, 565-572, 574-576, 578-581, 582-588, 589-596, 598-612, 613-616, 617-618, 619-625, 626-630, 637-642, 644-651, 652-661, 662-671, 672-681, 682-690, 691-692, 714-715, 726-727, 730-734, 751-752, 758-767, 782-786, 787-793, 801-806, 808-813, 825-831, 832-837, 838-841, 842-844, 850-858, 859-861, 864-873, 876-880, 881-883, 885-888, 890-894, 895-898, 902-906, 908-914, 915-922, 923-926, 927-929
3. Write functions and relations in parametric form.	Related material: SE/TE: 717-718, 734, 757-764, 766, 908-914
4. Identify vector-valued functions using a variety of approaches, e.g., algebraically or graphically.	SE/TE: 907-914, 924, 926, 927
5. Identify and generate arithmetic and geometric sequences and series recursively and explicitly using correct notation.	SE/TE: 561, 563-564, 565-572, 574-577, 578-581, 582-588, 589-596, 597-611, 626-630
6. Identify a geometric series as convergent or divergent.	SE/TE: 589-597, 602, 605, 609, 611, 627-628, 630
7. Raise a binomial to a power using the Binomial Theorem.	SE/TE: 617-618, 619-625, 628-630, 654, 670-671, 672
<b>Objective 2.2 Evaluate, solve, and analyze mathematical situations using algebraic properties and symbols.</b>	
1. Solve equations and inequalities involving exponential, logarithmic, power, polynomial, rational, and trigonometric functions, including real-world situations.	SE/TE: 181-188, 205-221, 260-263, 264-268, 269-274, 301-317, 378-383, 387-405, 407-411, 425-432, 850-858, 864, 915-923
2. Compare logarithmic and exponential functions.	SE/TE: 289-295, 319-321

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3. Combine and compose functions using algebraic methods or by using technology when appropriate.	SE/TE: 128, 131, 323-324, 414-416, 443-452, 801-802, 808-813, 841-844, 845-850
4. Identify the domain and range of a function resulting from the combination or composition of functions.	SE/TE: 325-328, 371-377, 379, 396, 406, 414-416, 454
5. Solve systems of linear equations involving three or more variables using a variety of methods.	SE/TE: 134, 138-142, 146-149, 150-152, 157-169, 170
6. Solve systems of non-linear equations and inequalities.	SE/TE: 408, 497-507, 512
7. Find the x- and y-intercepts, zeros (roots), maxima, and minima of functions.	SE/TE: 75, 78-79, 81-82, 84, 88, 90-93, 181-188, 202-204, 514-515, 533-544, 545-549, 550-554
8. Approximate instantaneous rates of change and find average rates of change using graphical and numerical data.	Related material: SE/TE: 75-82, 84, 86, 87-93, 94-105, 536, 543-544, 545-549
9. Determine intervals over which a function is increasing or decreasing.	SE/TE: 58-64, 70-71, 202-204, 324, 325-328, 374-377, 407, 410-411, 533-544, 545-549, 550-554, 737-740
<b>Objective 2.3 Represent quantitative relationships using mathematical models and symbols.</b>	
1. Represent quantitative, real-world situations using exponential, logarithmic, power, polynomial, rational, and trigonometric functions, vector and parametric equations, and sequences and series.	SE/TE: 58-64, 93-105, 157-169, 204-221, 300-317, 387-406, 432-442, 445-452, 549-554, 597-612, 756-767, 786-793, 915-919
2. Identify and analyze graphical features of functions such as asymptotes, holes, local, global, and end behavior.	SE/TE: 60-64, 65-69, 70, 74-82, 88-89, 115-116, 176-179, 196, 202-203, 231, 290-294, 324-328, 370-377, 385, 414, 516, 533-534, 536-538, 543, 546, 735-742, 743-749, 750-755, 756-767, 769, 771, 787-788, 791
3. Recognize symmetric properties of even and odd functions.	SE/TE: 813, 814-816, 820, 823, 846, 848, 853, 858-859
4. Relate the graphical representation of discontinuities and end-behavior to the concept of limit.	Related material: SE/TE: 60-61, 324-328, 370-377, 384-385, 738-741

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5. Identify the effects of changing the parameters in transformations of functions.	SE/TE: 74-75, 80, 176-179, 290-294, 371-375, 384-385, 515-516, 534, 742-749, 750-755, 756-767
6. Identify a family or families of functions that model real-world relationships.	SE/TE: 93-105, 204-221, 300-317, 387-406, 432-442, 445-452, 549-554, 597-612, 756-767, 786-793
<b>Standard 3 Students will solve problems using spatial and logical reasoning, applications of geometric principles, and modeling.</b>	
<b>Objective 3.1 Analyze characteristics and properties of two- and three-dimensional shapes and develop mathematical arguments about geometric relationships.</b>	
1. Determine and analyze the characteristics of graphs and the related equations of conic sections.	SE/TE: 460-461, 462-467, 468-477, 478-486, 487-490, 491-495, 496, 497-506, 507-512
2. Analyze problems and solutions involving vectors using algebraic and graphical techniques.	SE/TE: 901-906, 907-914, 915-922, 924, 926, 927, 929
<b>Objective 3.2 Specify locations and describe spatial relationships using coordinate geometry.</b>	
1. Perform transformations on exponential, power, polynomial, rational, logarithmic, and trigonometric functions.	SE/TE: 464-465, 470-471, 474-475, 482-485, 487-488, 493-495, 515-516, 534, 744-748
2. Draw or sketch polar equations using technology and other techniques.	Related material: SE/TE: 518, 522-523, 711-717, 721, 728, 768, 772-775, 782-783
<b>Standard 4 Students will understand and apply measurement tools, formulas, and techniques.</b>	
<b>Objective 4.1 Understand measurable attributes of objects and the units, systems, and processes of measurement.</b>	
1. Select appropriate units and scales for situations involving measurement.	SE/TE: 94-105, 108, 128-133, 142, 157-169, 170-171, 205-221, 259, 263, 282, 301-317, 319-321, 342-343, 387-406, 432-442, 445-451, 505, 550-554, 597-612, 710-711, 712-717, 718-728, 729-734, 735-742, 743-749, 750-755, 757-767, 773-781, 782-786, 787-793, 838-841, 851-858, 859-860, 864-873, 876-879, 881-883, 884-888, 890-893, 896-898, 901-906, 908-914, 915-922, 923-926, 927-928
2. Recognize the changes in magnitude with various measurement scales, e.g., Richter, pH, decibel.	SE/TE: 282, 312-314, 342-343, 387-406, 450-451

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<b>Standard 5 Students will draw conclusions using concepts of probability after collecting, organizing, and analyzing a data set.</b>	
<b>Objective 5.1 Formulate and answer questions by collecting, organizing, and analyzing data.</b>	
1. Find regression equation for bivariate data including power, exponential, logarithmic, polynomial, and sinusoidal curves using technology.	SE/TE: 96-97, 205-218, 297-300, 301-317, 387-406
2. Interpolate and extrapolate from data using regression equations.	SE/TE: 96-97, 205, 210-214, 216, 297, 300-317, 387-406
3. Identify how sample statistics reflect population parameters.	SE/TE: 690-700, 701-702, 705
<b>Objective 5.2 Apply basic concepts of probability.</b>	
1. Find sample spaces and probability distributions in simple cases.	SE/TE: 632-633, 634-636, 637-642, 643-651, 652-661, 662-671, 671-681, 682-690, 691-700, 701-705
2. Differentiate between independent and dependent events and calculate the probability of each.	SE/TE: 663-670, 671, 675, 679-681
3. Calculate the conditional probability of an event.	SE/TE: 662-671, 672-681, 682-690
4. Calculate the probability of a compound event.	SE/TE: 636-642, 662-671, 672-681
5. Calculate and interpret the expected value (weighted average) of random variables in simple cases.	SE/TE: 671-681, 682-690, 691-700, 701-705