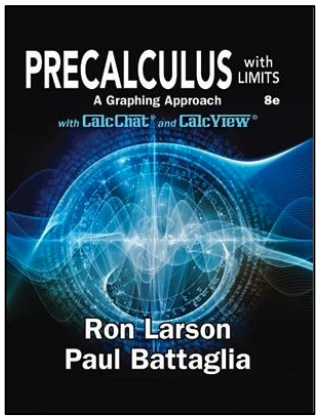
NATIONAL GEOGRAPHIC LEARNING | Cengage



Correlation of

Precalculus with Limits: A Graphing Approach, 8/E, by Ron Larson/Paul Battaglia, ©2020, ISBN: 9781337904285

to

Oklahoma Academic Standards for Mathematics Precalculus (PC) (2022)

A Correlation of *Precalculus with Limits: A Graphing Approach* to the OAS-M for Mathematics Precalculus (PC) (2022)

Table of Contents:

OAS-M for Mathematics Precalculus (PC) (2022)	***Precalculus with Limits: A Graphing Approach***
Functions (F)	
PC.F.1 Analyze functions and relations.	
PC.F.1.1 Interpret characteristics of a function defined by an expression in the context of the situation.	**page 21 (Example 6)** **page 22 (Example 9)** **page 33 (Example 7)** **page 95 (Example 5)** **page 146** **page 190** **page 200** pages 27-28 page 39 pages 48-49 page 98 pages 111-112 (Exercise 111 on page 112) page 141 pages 148-150 pages 158-159 pages 173-174 pages 192-193 page 203 pages 244-245 page 252 (Exercise 26) page 303 page 315 (Exercise 67)
PC.F.1.2 Sketch the graph of a function that models a relationship between two quantities, identifying key features.	**pages 29-36** **pages 42-46** **pages 63-66** **pages 90-95** **pages 100-108** **pages 142-146** **pages 151-156** **pages 183-187** **pages 189-190** **pages 196-200** **pages 294-300** **pages 306-312** pages 37-40 (Exercise 112 on page 40) pages 47-49 pages 67-70

	pages 82-83 pages 85-86 pages 96-99 pages 109-112 pages 147-150 (Exercise 48 on page 149) pages 157-160 pages 168-169 page 174 page 177 pages 191-193 pages 201-204 pages 244-246 pages 250-251 pages 301-305 pages 313-316
PC.F.1.3 Interpret characteristics of graphs and tables for a function that models a relationship between two quantities in terms of the quantities.	**pages 31-34** **pages 90-92** **page 95** **pages 102-103** **page 105** **pages 142-145** **pages 152-155** **pages 183-184** **pages 186-187** **page 190** **pages 196-197** **pages 294-300** **pages 306-310** page 38 page 40 (Exercise 112) page 82 page 86 page 110 pages 147-148 pages 157-159 pages 168-169 pages 173-174 page 177 pages 191-192 pages 201-204 (Exercises 45-50 on page 201) pages 244-246 page 251 page 301 page 303 page 305 pages 313-316
PC.F.1.4 Describe end behavior, asymptotic behavior, and points of discontinuity.	**page 100** (continuity/discontinuity) **pages 102-103** (leading coefficient test) **pages 142-146** (asymptotes and holes) **pages 152-155** **pages 183-185**

	pages 196-197 pages 106-107 pages 109-110 (end behavior) pages 148-150 page 187 pages 191-192 pages 201-202 (Exercises 45-50 on page 201: includes finding vertical asymptotes) pages 244-245 page 250
PC.F.1.5 Determine if a function has an inverse. Algebraically and graphically find the inverse or define any restrictions on the domain that meet the requirement for invertibility, and find the inverse on the restricted domain.	**page 60-61** **page 64** (determining if a function has an inverse function) **pages 65-66** (finding an inverse function algebraically; Example 11 on page 66: restricted domain) **page 84** **page 198** page ix (Preface) pages 67-69 pages 85-86 page 167 (Exercises 33-36) page 193 (Exercises 89 - 92) page 196 (Example 4) page 201 (Exercises 1, 4) page 204 (Exercise 126) pages 317-327 (inverse trigonometric functions and their restrictions) page A-2 (Appendix A Technology Support)
PC.F.2 Build functions to model and validate relationships among functions.	
PC.F.2.1 Model relationships through composition, and attend to the restrictions of the domain.	**pages 52-54 (Example 8 on page 54)** page 55 pages 57-59
PC.F.2.2 Rewrite a function as a composition of functions.	**page 54 (Example 9)** page 57 (Exercises 71-78)
PC.F.2.3 Interpret the meanings of quantities involving functions and their inverses.	**pages 60-61** **pages 63-66** **pages 317-319** pages 67-70 page 198 page 324
PC.F.2.4 Verify by analytical methods that one function is the inverse of another.	**page 62** page 67 (Exercises 17-22; Exercises 23-32: includes analytical) page 85 (Exercises 93-96)
PC.F.3 Predict and verify solutions involving functions.	
PC.F.3.1 Predict solutions involving functions that are quadratic, polynomial of higher order, rational, exponential, and logarithmic.	**page 108** (Intermediate Value Theorem–predict location of real zeros) **page 122** (Example 10: using Descartes' Rule of Signs to predict number of positive real zeros)

	page 217 (approximating solution to logarithmic equation) page 97 (Exercises 41-44: visually estimating solutions from a graph) page 111 (Exercises 93-98) pages 220-221 (Exercises 107-114: using graphing utility to estimate the solution)
PC.F.3.2 Graphically verify solutions involving functions that are quadratic, polynomial of higher order, rational, exponential, and logarithmic.	**page 94** (Example 3: quadratic) **pages 104-105** (polynomial of higher order) **page 120** (Example 8: polynomial of higher order) **pages 122-123** (polynomial of higher order) **page 139** (Example 7: polynomial of higher order) **pages 153-156** (rational) **pages 213-214** (exponential) **pages 215-216** (logarithmic) **page 218** (Example 12: exponential) **page 224** (exponential) **page 226** (Example 3: exponential) page 96 (Exercises 13-32: quadratic) page 110 (Exercises 37-58: polynomial of higher order) page 125 (Exercises 53-58: polynomial of higher order) page 140 (Exercises 19-46: polynomial of higher order) page 157 (Exercises 17-32: rational) pages 220-221 (Exercises 107-114: exponential and logarithmic and Exercises 115-122: exponential and logarithmic) page 222 (Exercise 140: logarithmic)
PC.F.3.3 Algebraically verify solutions involving functions that are quadratic, polynomial of higher order, rational, exponential, and logarithmic.	**page 104** (Example 4: polynomial of higher order) **page 139** (Example 7: polynomial of higher order) **pages 213-214** (exponential) **pages 215-216** (logarithmic) **page 217** (logarithmic) **page 224** (exponential) **page 226** (Example 3: exponential) page 97 (Exercises 41-50: quadratic) page 219 (Exercises 45-46: exponential) pages 220-221 (Exercises 75-76: logarithmic; Exercises 107-114: exponential and logarithmic)
Conic Sections (CS)	
PC.CS.1 Investigate conic sections.	
PC.CS.1.1 Model real-world situations which involve conic sections.	**page 651** pages 655-656 page 661 (Example 5) pages 664-665 (Exercises 57, 58) page 671

	page 676 page 677 (Exercises 55, 56) page 689 (Example 5)
PC.CS.1.2 Identify key features of conic sections (foci, directrix, radii, axes, asymptotes, center) graphically and algebraically.	**page 647 (Example 1, radii)** **pages 649-650 (directrix, focus, axis , Example 5)** **pages 666-667 (foci, axes, center, Example 1)** page 657 (foci, axes, center) page 668 (asymptotes) page 653 (Exercises 11 - 16) page 654 (Exercises 55 - 72) page 660 (Example 4) page 669 (Example 2, asymptotes) page 676 (Exercises 31b - 40b)
PC.CS.1.3 Sketch a graph of a conic section using its key features.	**pages 648-649 (Example 2)** **page 657** **page 660 (Example 3)** page 653 (Exercises 25 - 32) page 659 page 664 (Exercises 31 - 46) pages 668-9 page 676 (Exercises 21 - 30, 31c - 4 0c)
PC.CS.1.4 Write the equation of a conic section given its key features.	**pages 647-650 (Examples 4 - 6)** **pages 658-658** **pages 666-670 (Example 4)** page 653 (Exercises 17 -24) page 654 (Exercises 43 - 54, 73 - 84) page 659 (Example 1) page 663 (Exercise 11 - 30) page 667 (Example 1) page 676 (Exercises 11 - 15, 31a - 40a, 41 - 50)
PC.CS.1.5 Given the equation $ax^2 + by^2 + cx + dy + e = 0$, determine if the equation represents a circle, ellipse, parabola, or hyperbola.	**page 672** page 675 (Exercise 6) page 677 (Exercises 57 -62) page 678 (Exercise 100) page 714 (Exercise 5)
Trigonometry (T)	
PC.T.1 Make sense of the unit circle and its relationship to the graphs of trigonometric functions.	
PC.T.1.1 Draw and recognize angles in standard position using radian measure, and determine the quadrant of the terminal side.	**pages 256-258** page 263 page 340 (Exercises 1-2) page 347 (Exercise 1a)
PC.T.1.2 Convert radian measure to degree measure and vice-versa.	**pages 259-260** (Example 3 on page 260) page 264 (Exercises 47-66) page 305 (Exercises 117-118) page 340 (Exercises 5-8) page 347 (Exercise 1c) page 378 (Exercises 111-114)

PC.T.1.3 Find the length of an arc and the area of a sector on a circle.	**page 257** (arc length) **pages 261-262** (arc length) pages 265-266 (Exercises 114-116 on page 266: area of a sector; Exercise 117 on page 266: arc length and area of a sector) page 340 (Exercises 17-18) page 347 (Exercises 3-4)
PC.T.1.4 Use special triangles to determine geometrically the values of sine, cosine, tangent for $\frac{\pi}{3}$, $\frac{\pi}{4}$, and $\frac{\pi}{6}$, and use the unit circle to express the values of sine, cosine, and tangent for $\pi - x$, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.	**pages 276-277** **pages 288-290** pages 282-283 (Exercises 21-26 on page 282; Exercises 67-72 on page 283) page 292 (Exercises 47-66) page 343 (Exercises 67-74)
PC.T.1.5 Use reference angles to determine the terminal point P(x, y) on the unit circle for a given angle.	**pages 267-269** **page 290** page 272 page 292 (Exercises 67-78)
PC.T.1.6 Estimate trigonometric values of any angle.	**page 273**
PC.T.1.7 Apply the properties of a unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.	**pages 267-271** pages 272-274
PC.T.1.8 Graph of all six trigonometric functions, identifying key features.	**pages 294-300** **pages 306-312** pages 301-305 pages 313-316
PC.T.1.9 Describe and analyze the relationships of the properties of a unit circle.	**pages 267-271** **pages 276-277** **pages 287-290** pages 272-274 pages 282-283 pages 291-293
PC.T.2 Apply trigonometric concepts beyond the right triangle.	
PC.T.2.1 Create models for situations involving trigonometry.	**page 300** **pages 328-333** page 303 (Exercises 97-98) pages 334-339
PC.T.2.2 Apply the Law of Sines and Law of Cosines to solve problems.	**pages 406-411** **pages 415-418** pages 412-414 pages 419-421 pages 462-463 page 469
PC.T.2.3 Use trigonometry to find the area of triangles.	**pages 410-411** **page 418** page 412 page 414 (Exercise 55)

	page 420 page 421 (Exercise 54) pages 462-463 page 469
PC.T.2.4 Use inverse functions to solve trigonometric equations; evaluate the solution and interpret them in terms of context.	**pages 317-323** **pages 329-330** **page 373** pages 326-327 pages 334-339 page 376 page 398
PC.T.3 Verify trigonometric identities and solve equations.	
PC.T.3.1 Algebraically manipulate the structure of a trigonometric expression to identify ways to rewrite it.	**pages 352-355** **pages 359-363** pages 356-358 pages 364-366 pages 396-397 page 401
PC.T.3.2 Choose and produce an equivalent form of an expression to explain the properties of the quantity represented by the expression.	**pages 359-363** pages 364-366 page 397 page 401
PC.T.3.3 Graphically and algebraically verify solutions to trigonometric equations.	**pages 367-374** pages 375-376
PC.T.4 Explore complex numbers.	
PC.T.4.1 Use the relation $i^2 = -1$ and the mathematical properties to add, subtract, and multiply complex numbers.	**pages 129-130** page 133 (Exercises 21-30: adding and subtracting complex numbers; Exercises 31-42: multiplying complex numbers) page 171 (Exercises 69-76)
PC.T.4.2 Find the conjugate of a complex number in rectangular forms and quotients of complex numbers.	**page 131** (finding complex conjugates and finding quotients of complex numbers) page 133 (Exercises 43-50: writing the complex conjugate of a complex number; Exercises 51-58: finding quotients of complex numbers) page 167 (Exercises 37-40: writing complex conjugates) page 171 (Exercises 77-80) page 447 (Example 4) page 450 (Exercises 37-40: finding a complex conjugate) page 467 (Exercises 97-98: finding a complex conjugate) page 471 (Exercise 20: finding graph of a complex conjugate)
PC.T.4.3 Solve quadratic equations in one variable that have complex solutions.	**page 132** (Example 6) page 134 (Exercises 69-80) page 171 (Exercises 81-86)