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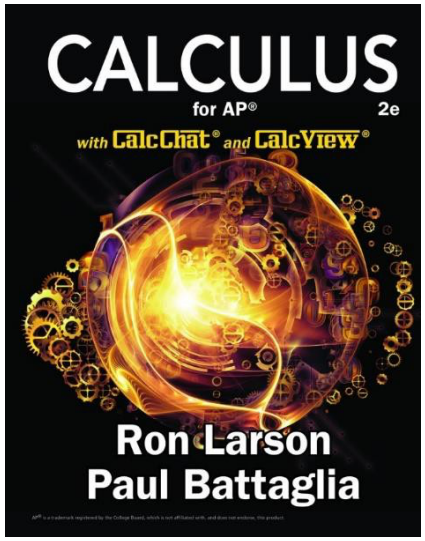

Correlation of

Calculus for AP®, 2/E,
by Ron Larson/ Paul Battaglia, © 2021,
ISBN: 9780357431948/9780357520314

to

Indiana
Academic Standards for Mathematics
High School
Calculus

Correlation to the Indiana Academic Standards for Mathematics, High School: Calculus
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Academic Standards for Mathematics	SE Where Addressed	TE Where Addressed
PROCESS STANDARDS FOR MATHEMATICS		
PS.1: Make sense of problems and persevere in solving them.	Performance Task (pp. 122, 210, 278, 368, 408, 454, 532, 630, 710)	Performance Task (pp. 122, 210, 278, 368, 408, 454, 532, 630, 710)
PS.2: Reason abstractly and quantitatively.	Section 2.6 (p. 188), Section 3.5 (pp. 252, 254-255), Section 3.7 (p. 273), Section 4.2 (pp. 300-301), Section 4.3 (pp. 315-316), Section 4.4 (pp. 326, 328)	Section 2.6 (p. 188), Section 3.5 (pp. 252, 254-255), Section 3.7 (p. 273), Section 4.2 (pp. 300-301), Section 4.3 (pp. 315-316), Section 4.4 (pp. 326, 328)
PS.3: Construct viable arguments and critique the reasoning of others.	Section 4.7 (p. 355), Section 5.2 (p. 379), Section 5.3 (pp. 395-396), Section 6.1 (pp. 417, 419), Section 6.4 (p. 447)	Section 4.7 (p. 355), Section 5.2 (p. 379), Section 5.3 (pp. 395-396), Section 6.1 (pp. 417, 419), Section 6.4 (p. 447)
PS.4: Model with mathematics.	Review Exercises (p. 206), Performance Task (p. 210), Section 3.4 (pp. 243-244), Section 3.6 (pp. 260-261), Performance Task (p. 278), Section 4.4 (p. 322)	Review Exercises (p. 206), Performance Task (p. 210), Section 3.4 (pp. 243-244), Section 3.6 (pp. 260-261), Performance Task (p. 278), Section 4.4 (p. 322)
PS.5: Use appropriate tools strategically.	Section 1.2 (pp. 73-75), Section 1.3 (p. 77), Section 2.3 (p. 156), Section 2.4 (pp. 169, 171), Section 2.6 (p. 188), Section 5.2 (p. 382)	Section 1.2 (pp. 73-75), Section 1.3 (p. 77), Section 2.3 (p. 156), Section 2.4 (pp. 169, 171), Section 2.6 (p. 188), Section 5.2 (p. 382)
PS.6: Attend to precision.	Section 1.6 (p. 117), Section 2.1 (p. 134), Section 2.2 (p. 146), Section 2.4 (p. 173), Section 3.3 (p. 236), Section 4.2 (pp. 299-300)	Section 1.6 (p. 117), Section 2.1 (p. 134), Section 2.2 (p. 146), Section 2.4 (p. 173), Section 3.3 (p. 236), Section 4.2 (pp. 299-300)
PS.7: Look for and make use of structure.	Section 2.3 (p. 158), Section 2.4 (p. 173), Section 3.6 (p. 264), Section 4.1 (p. 283), Section 4.6 (pp. 334-336), Section 7.1 (p. 462), Section 7.2 (p. 471), Section 7.7 (p. 508)	Section 2.3 (p. 158), Section 2.4 (p. 173), Section 3.6 (p. 264), Section 4.1 (p. 283), Section 4.6 (pp. 334-336), Section 7.1 (p. 462), Section 7.2 (p. 471), Section 7.7 (p. 508)
PS.8: Look for and express regularity in repeated reasoning.	Performance Task (p. 122), Section 2.4 (p. 164), Section 2.8 (p. 199), Section 4.4 (p. 318), Section 7.2 (p. 466), Performance Task (p. 368)	Performance Task (p. 122), Section 2.4 (p. 164), Section 2.8 (p. 199), Section 4.4 (p. 318), Section 7.2 (p. 466), Performance Task (p. 368)
Limits and Continuity		
C.LC.1 Understand the concept of limit and estimate limits from graphs and tables of values	Section 1.2 (pp. 65-70)	Section 1.2 (pp. 65-70)
C.LC.2 Find limits by substitution.	Section 1.3 (p. 76)	Section 1.3 (p. 76)
C.LC.3 Find limits of sums, differences, products, and quotients.	Section 1.3 (pp. 76-77)	Section 1.3 (pp. 76-77)
C.LC.4 Find limits of rational functions that are undefined at a point.	Section 1.3 (pp. 79-83)	Section 1.3 (pp. 79-83)
C.LC.5 Find limits at infinity.	Section 1.6 (pp. 108-113)	Section 1.6 (pp. 108-113)
C.LC.6 Decide when a limit is infinite and use limits involving	Section 1.6 (p. 114)	Section 1.6 (p. 114)

Academic Standards for Mathematics	SE Where Addressed	TE Where Addressed
infinity to describe asymptotic behavior. Find special limits.		
C.LC.7 Find one-sided limits.	Section 1.4 (pp. 89-90)	Section 1.4 (pp. 89-90)
C.LC.8 Understand continuity in terms of limits.	Section 1.4 (pp. 87-88)	Section 1.4 (pp. 87-88)
C.LC.9 Decide if a function is continuous at a point.	Section 1.4 (p. 87)	Section 1.4 (p. 87)
C.LC.10 Find the types of discontinuities of a function.	Section 1.4 (pp. 87-88)	Section 1.4 (pp. 87-88)
C.LC.11 Understand and use the Intermediate Value Theorem on a function over a closed interval.	Section 1.4 (pp. 94-95)	Section 1.4 (pp. 94-95)
C.LC.12 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.	Section 3.1 (pp. 212-216)	Section 3.1 (pp. 212-216)
Differentiation		
C.D.1 Understand the concept of derivative geometrically, numerically, and analytically, and interpret the derivative as a rate of change.	Section 2.1 (pp. 124-128, 131), Section 2.2 (p. 142)	Section 2.1 (pp. 124-128, 131), Section 2.2 (p. 142)
C.D.2 State, understand, and apply the definition of derivative.	Section 2.1 (pp. 127-128)	Section 2.1 (pp. 127-128)
C.D.3 Find the derivatives of functions, including algebraic, trigonometric, logarithmic, and exponential functions.	Section 2.2 (pp. 135-141)	Section 2.2 (pp. 135-141)
C.D.4 Find the derivatives of sums, products, and quotients.	Section 2.2 (p. 139), Section 2.3 (pp. 148-153)	Section 2.2 (p. 139), Section 2.3 (pp. 148-153)
C.D.5 Find the derivatives of composite functions, using the chain rule.	Section 2.4 (pp. 159-168)	Section 2.4 (pp. 159-168)
C.D.6 Find the derivatives of implicitly-defined functions.	Section 2.5 (pp. 174-179)	Section 2.5 (pp. 174-179)
C.D.7 Find the derivatives of inverse functions.	Section 2.6 (pp. 183-185)	Section 2.6 (pp. 183-185)
C.D.8 Find second derivatives and derivatives of higher order.	Section 2.3 (p. 154), Section 2.5 (p. 178)	Section 2.3 (p. 154), Section 2.5 (p. 178)
C.D.9 Find derivatives using logarithmic differentiation.	Section 2.5 (p. 179)	Section 2.5 (p. 179)
C.D.10 Understand and apply the relationship between differentiability and continuity.	Section 2.1 (pp. 129-130)	Section 2.1 (pp. 129-130)
C.D.11 Understand and apply the Mean Value Theorem.	Section 3.2 (pp. 222-223)	Section 3.2 (pp. 222-223)
Applications of Derivatives		
C.AD.1 Find the slope of a curve at a point, including points at which there are vertical tangents and no tangents.	Section 2.1 (p. 126-130)	Section 2.1 (p. 126-130)
C.AD.2 Find a tangent line to a curve at a point and a local linear approximation.	Section 2.1 (pp. 124-128), Section 3.7 (p. 267)	Section 2.1 (pp. 124-128), Section 3.7 (p. 267)

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Academic Standards for Mathematics	SE Where Addressed	TE Where Addressed
C.AD.3 Decide where functions are decreasing and increasing. Understand the relationship between the increasing and decreasing behavior of f and the sign of f'.	Section 3.3 (pp. 227-228)	Section 3.3 (pp. 227-228)
C.AD.4 Solve real-world and other mathematical problems finding local and absolute maximum and minimum points with and without technology.	Section 3.3 (pp. 229-232, 235)	Section 3.3 (pp. 229-232, 235)
C.AD.5 Analyze real-world problems modeled by curves, including the notions of monotonicity and concavity with and without technology.	Section 3.3 (pp. 228-232), Section 3.4 (pp. 237-241, 243-244)	Section 3.3 (pp. 228-232), Section 3.4 (pp. 237-241, 243-244)
C.AD.6 Find points of inflection of functions. Understand the relationship between the concavity of f and the sign of f''. Understand points of inflection as places where concavity changes.	Section 3.4 (pp. 239-241)	Section 3.4 (pp. 239-241)
C.AD.7 Use first and second derivatives to help sketch graphs modeling real-world and other mathematical problems with and without technology. Compare the corresponding characteristics of the graphs of f, f', and f''.	Section 3.5 (pp. 245-252)	Section 3.5 (pp. 245-252)
C.AD.8 Use implicit differentiation to find the derivative of an inverse function.	Section 2.6 (p. 185)	Section 2.6 (p. 185)
C.AD.9 Solve optimization real-world problems with and without technology.	Section 3.6 (pp. 257-261)	Section 3.6 (pp. 257-261)
C.AD.10 Find average and instantaneous rates of change. Understand the instantaneous rate of change as the limit of the average rate of change. Interpret a derivative as a rate of change in applications, including distance, velocity, and acceleration.	Section P.2 (p. 16), Section 2.1 (pp. 127, 131), Section 2.2 (pp. 142-143)	Section P.2 (p. 16), Section 2.1 (pp. 127, 131), Section 2.2 (pp. 142-143)
C.AD.11 Find the velocity and acceleration of a particle moving in a straight line.	Section 2.2 (pp. 143, 146), Section 2.3 (pp. 154, 157-158), Performance Task (p. 210), Section 3.3 (pp. 235-236)	Section 2.2 (pp. 143, 146), Section 2.3 (pp. 154, 157-158), Performance Task (p. 210), Section 3.3 (pp. 235-236)
C.AD.12 Model rates of change, including related rates problems.	Section 2.7 (pp. 190-194)	Section 2.7 (pp. 190-194)
Integrals		
C.I.1 Use rectangle approximations to find approximate values of integrals.	Section 4.2 (pp. 293-298)	Section 4.2 (pp. 293-298)
C.I.2 Calculate the values of Riemann Sums over equal subdivisions using left, right, and midpoint evaluation points.	Section 4.3 (pp. 302-303)	Section 4.3 (pp. 302-303)
C.I.3 Interpret a definite integral as a limit of Riemann Sums.	Section 4.3 (pp. 304-305)	Section 4.3 (pp. 304-305)

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Academic Standards for Mathematics	SE Where Addressed	TE Where Addressed
C.I.4 Understand the Fundamental Theorem of Calculus: Interpret a definite integral of the rate of change of a quantity over an interval as the change of the quantity over the interval.	Section 4.4 (pp. 317-319)	Section 4.4 (pp. 317-319)
C.I.5 Use the Fundamental Theorem of Calculus to evaluate definite and indefinite integrals and to represent particular antiderivatives. Perform analytical and graphical analysis of functions so defined.	Section 4.4 (pp. 319, 322, 326-327)	Section 4.4 (pp. 319, 322, 326-327)
C.I.6 Understand and use these properties of definite integrals. a. $\int b\ a\ [f(x) + g(x)]dx = \int b\ a\ f(x)dx + \int b\ a\ g(x)dx$ b. $\int b\ a\ k \cdot [f(x)]dx = k \cdot \int b\ a\ f(x)dx$ c. $\int a\ a\ f(x)dx = 0$ d. $\int b\ a\ f(x)dx = -\int a\ b\ f(x)dx$ e. $\int b\ a\ f(x)dx + \int c\ b\ f(x)dx = \int c\ a\ f(x)dx$ f. $If\ f(x) \leq g(x)\ on\ [a, b], then \int b\ a\ f(x)dx \leq \int b\ a\ g(x)d$	Section 4.3 (pp. 307-309)	Section 4.3 (pp. 307-309)
C.I.7 Understand and use integration by substitution (or change of variable) to find values of integrals.	Section 4.6 (pp. 334-341)	Section 4.6 (pp. 334-341)
C.I.8 Understand and use Riemann Sums, the Trapezoidal Rule, and technology to approximate definite integrals of functions represented algebraically, geometrically, and by tables of values.	Section 4.3 (pp. 302-311)	Section 4.3 (pp. 302-311)
Applications of Integrals		
C.AI.1 Find specific antiderivatives using initial conditions, including finding velocity functions from acceleration functions, finding position functions from velocity functions, and applications to motion along a line.	Section 4.1 (pp. 286, 288-289)	Section 4.1 (pp. 286, 288-289)
C.AI.2 Solve separable differential equations and use them in modeling real-world problems with and without technology.	Section 5.3 (pp. 387-392)	Section 5.3 (pp. 387-392)
C.AI.3 Solve differential equations of the form y' = ky as applied to growth and decay problems.	Section 5.2 (pp. 380-383)	Section 5.2 (pp. 380-383)
C.AI.4 Use definite integrals to find the area between a curve and the x-axis, or between two curves.	Section 6.1 (pp. 410-415)	Section 6.1 (pp. 410-415)
C.AI.5 Use definite integrals to find the average value of a function over a closed interval.	Section 4.4 (pp. 321-322)	Section 4.4 (pp. 321-322)

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Academic Standards for Mathematics	SE Where Addressed	TE Where Addressed
C.AI.6 Use definite integrals to find the volume of a solid with known cross-sectional area.	Section 6.2 (pp.420-426), Section 6.3 (pp. 431-435), Performance Task (p. 454)	Section 6.2 (pp.420-426), Section 6.3 (pp. 431-435), Performance Task (p. 454)
C.AI.7 Apply integration to model and solve (with and without technology) real-world problems in physics, biology, economics, etc., using the integral as a rate of change to give accumulated change and using the method of setting up an approximating Riemann Sum and representing its limit as a definite integral.	Section 6.1 (pp. 418-419), Section 6.2 (pp. 425, 429), Section 6.3 (pp. 435, 438-439), Section 6.4 (pp. 443, 447-449), Performance Task (p. 454)	Section 6.1 (pp. 418-419), Section 6.2 (pp. 425, 429), Section 6.3 (pp. 435, 438-439), Section 6.4 (pp. 443, 447-449), Performance Task (p. 454)