Precalculus 2nd Edition Standard   
Lesson Plan Overview

The Standard Lesson Plan allocates 90 days for each semester.

**Key:**

• Assessments

• Student Edition features:

• TC: Technology Corner

• HC: Historical Connection

• BPM: Biblical Perspective of Mathematics

• DA: Data Analysis

• Biblical worldview topics in the Teacher Edition

| Day | Topic | Pages | Assessment | Biblical Worldview |
| --- | --- | --- | --- | --- |
| Chapter 1 Analyzing Functions | | | | |
| 1 | Introduction | v–1 |  |  |
| 2 | 1.1 Relations and  Functions  TC: Multiple Representations | 2–8  6 |  | * gaining a better understanding of infinity through knowing God * declaring God’s infinite nature and recognizing His creation (Ps. 90:2) |
| 3–4 | HC: Functions  1.2 Linear Functions  BPM: The Gift of Mathematics | 9  10–16  17 |  | * explaining the laws of the physical world  from a biblical worldview (Gen. 1:1, 27) * recognizing the flaws in Descartes’s reasoning * viewing mathematics as a divine gift, an  intrinsic part of His creation (Ps. 104:24) |
| 5–6 | 1.3 Piecewise Functions and  Continuity | 18–24 | Quiz 1A (1.1–1.2) |  |
| 7 | 1.4 Power Functions and Variations | 25–31 |  |  |
| 8–9 | 1.5 Transformations of Functions | 32–38 | Quiz 1B (1.3–1.4) |  |
| 10 | 1.6 Quadratic Functions | 39–45 |  |  |
| 11–12 | 1.7 Function Operations | 46–51 | Quiz 1C (1.5–1.6) | * identifying underlying fundamental laws  evident in God’s creation * recognizing how technology is making the fulfillment of prophecy more imminent  (Rev. 13:17) |
| 13–14 | 1.8 Parametric Equations and  Inverses | 52–58 |  |  |
| 15–16 | 1.9 Modeling with Functions | 59–66 | Quiz 1D (1.7–1.8) |  |
| 17 | DA: Home Run | 67 |  | * recognizing the human limitation of  mathematics and mathematical models |
| 18 | Chapter 1 Review | 68–70 | Quiz 1E (1.9) |  |
| 19 | Chapter 1 Test | | | |

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| Chapter 2 Radical, Polynomial, and Rational Functions | | | | |
| 20 | 2.1 Radical Functions and Equations | 72–77 |  |  |
| 21 | 2.2 Polynomial Functions | 78–85 |  |  |
| 22 | TC: Discontinuities | 85 | Quiz 2A (2.1–2.2) |  |
| 23 | 2.3 The Remainder and Factor  Theorems  HC: Symbols | 86–92  93 |  | * understanding that elements of mathematics transcend human intellect * creating math symbols to describe what God has created |
| 24–25 | 2.4 Zeros of Polynomial Functions  BPM: Math’s Divine Nature | 94–101  102–3 | Quiz 2B (2.3–2.4) | * understanding how Christianity’s fundamental doctrines apply to math * learning about key common attributes of God and math * understanding infallible transcendent  mathematics |
| 26 | 2.5 Rational Functions | 104–11 |  | * recognizing how our limited understanding inspires awe and worship of God (Job 38–41) |
| 27 | 2.6 Solving Rational Equations | 112–17 |  | * understanding universal mathematical truth and the goodness in its applications |
| 28–29 | 2.7 Nonlinear Inequalities | 118–23 | Quiz 2C (2.5–2.6) |  |
| 30 | DA: The Housing Market | 124 | Quiz 2D (2.7) | * using biblical wisdom and discernment in home buying (Prov. 22:3, 7) |
| 31 | Chapter 2 Review | 125–26 |  |  |
| 32 | Chapter 2 Test | | | |

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| Chapter 3 Exponential and Logarithmic Functions | | | | |
| 33 | 3.1 Exponential Functions | 128–35 |  |  |
| 34 | 3.2 Logarithmic Functions | 136–41 |  |  |
| 35 | HC: Napier’s Artificial Numbers | 142 | Quiz 3A (3.1–3.2) | * predicting the return of Christ (Matt. 24:36) |
| 36 | 3.3 Properties of Logarithms | 143–48 |  |  |
| 37–38 | 3.4 Exponential and Logarithmic  Equations  BPM: Glorifying God with Math | 149–54  155 |  | * lending and investing money  (Deut. 15:1–7; 23:19; Matt. 25:14–30) * glorifying God through math (1 Cor. 10:31) * fulfilling the Creation Mandate (Gen. 1:26–28;  Ps. 8) |
| 39–40 | 3.5 Exponential, Logistic, and  Logarithmic Models  TC: Transformed Data | 156–65  162 | Quiz 3B (3.3–3.4) |  |
| 41 | DA: A World Population Crisis? | 166–67 | Quiz 3C (3.5) | * responding biblically to world population growth (Gen. 1:27–28; Matt. 6:3, 11–32; 28:19; Jer. 1:5; Gal. 5:13–14; Phil. 4:9; 1 Thess. 4:16) * meeting the needs of the poor and sharing the gospel |
| 42 | Chapter 3 Review | 168–70 |  |  |
| 43 | Chapter 3 Test | | | |
| 44 | Review for First Quarter Exam (Chapters 1–3) | | | |
| 45 | First Quarter Exam | | | |

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| Chapter 4 Trigonometric Functions | | | | |
| 46 | 4.1 Angle Measure and Arc Length | 172–78 |  |  |
| 47 | 4.2 Right Triangle Trigonometry | 179–86 |  |  |
| 48 | HC: Trigonometry | 187 | Quiz 4A (4.1–4.2) |  |
| 49 | 4.3 Extending Trigonometric  Functions  TC: Parametric Graphs of  Trigonometric Functions | 188–95  196 |  | * identifying periodic functions in creation  (Gen. 8:22) |
| 50–51 | 4.4 Sinusoidal Functions | 197–205 |  | * recognizing that life begins before birth  (Jer. 1:4–5) * evaluating cyclic patterns in nature from a  biblical perspective (Deut. 17:2–3; 2 Kings 23:5) |
| 52 | 4.5 Graphing Other Trigonometric Functions | 206–13 |  |  |
| 53 | BPM: The Utility and Value of  Mathematics | 214–15 | Quiz 4B (4.3–4.5) | * exploring how mathematical truth applies to the real world through recognizing God as Creator of both the universe and the human ability to describe it |
| 54 | 4.6 Inverse Trigonometric Functions | 216–22 |  | * acknowledging our inability to count the stars and grains of sand (Heb. 11:12) * recognizing the involvement of math in  a God-given sign of answered prayer  (2 Kings 20:8–11) |
| 55 | 4.7 Analyzing Combinations of  Sinusoidal Functions | 223–27 |  | * seeing how mathematical patterns appeal to our God-given sense of beauty |
| 56 | DA: Sunspots and Solar Flares | 228–29 | Quiz 4C (4.6–4.7) | * responding biblically to climate change  (Gen. 1:27–28; 8:20–22; Mark 12:31; Ps. 46:2–3) |
| 57 | Chapter 4 Review | 230–31 |  |  |
| 58 | Chapter 4 Test | | | |

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| Chapter 5 Trigonometric Identities and Equations | | | | |
| 59 | 5.1 Fundamental Identities | 233–39 |  | * exploring unity and beauty in mathematics established by God in His creation |
| 60 | 5.2 Verifying Trigonometric Identities | 240–45 |  | * using logical reasoning developed through math to live biblically |
| 61 | 5.3 Solving Trigonometric Equations | 246–51 |  |  |
| 62 | BPM: The Unity and Beauty of  Mathematics | 252–53 | Quiz 5A (5.1–5.3) | * acknowledging evidence of God’s unity and beauty in His universe |
| 63 | 5.4 Sum and Difference Identities | 254–60 |  |  |
| 64–65 | 5.5 Multiple Angle Identities | 261–67 |  |  |
| 66 | HC: Harmonic Analysis | 268 | Quiz 5B (5.4–5.5) | * recognizing math as more than a product of the human mind * learning about a mathematician’s testimony of faith in Christ |
| 67–68 | 5.6 Law of Sines  TC: Exploring the Law of Sines | 269–75  273 |  |  |
| 69 | 5.7 Law of Cosines | 276–81 |  |  |
| 70 | DA: Refraction, Reflection, and Fiber Optics | 282–83 | Quiz 5C (5.6–5.7) | * understanding the nature and source of light (Gen. 1:3–4; James 1:17) |
| 71 | Chapter 5 Review | 284–85 |  |  |
| 72 | Chapter 5 Test | | | |

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| Chapter 6 Vectors, Polar Graphs, and Complex Numbers | | | | |
| 73 | 6.1 Vectors in the Plane | 287–93 |  |  |
| 74–75 | 6.2 Dot Products | 294–300 |  |  |
| 76 | BPM: Truth and Mathematical Proof | 301–2 | Quiz 6A (6.1–6.2) | * acknowledging mathematical proof as an instrument of discovering truth (Phil. 4:8) * seeking truth through God’s Word v. worldly thinking (John 17:17; Phil. 4:8) |
| 77 | 6.3 Vectors in Space | 303–8 |  | * recognizing manmade mathematical models fail to completely describe God’s creation |
| 78–79 | 6.4 Polar Coordinates  TC: Graphing Polar Functions | 309–14  313 | Quiz 6B (6.3) |  |
| 80 | 6.5 Graphs of Polar Equations | 315–22 |  |  |
| 81 | HC: Complex Numbers | 323 | Quiz 6C (6.4–6.5) | * discovering how mathematical models reflect structure and design in the world |
| 82–83 | 6.6 Polar Forms of Complex Numbers | 324–30 |  |  |
| 84 | DA: Fractals | 331–32 |  | * understanding how similar design points to a common Creator * discussing chaos theory and the importance of a person’s worldview |
| 85 | Chapter 6 Review | 333–34 | Quiz 6D (6.6) |  |
| 86 | Chapter 6 Test | | | |
| 87–89 | Review for Second Quarter Exam (Chapters 4–6) or First Semester Exam (Chapters 1–6) | | | |
| 90 | Second Quarter Exam or First Semester Exam | | | |

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| Chapter 7 Systems and Matrices | | | | | |
| 91 | 7.1 Solving Systems of Equations | 336–42 |  | |  |
| 92 | 7.2 Matrices | 343–50 |  | | * using math for the benefit of mankind and the glory of God |
| 93 | BPM: Direct and Indirect Deductive Reasoning | 351–52 | Quiz 7A (7.1–7.2) | | * examining direct and indirect reasoning used in Scripture and in the Stein-Bahnsen debate on the existence of God (Acts 17:2; 18:4,19; 24:25; Heb. 5:14; 1 Pet. 3:15) * identifying transcendent mathematical truth as originating from God and His nature |
| 94–95 | 7.3 Gaussian Elimination  TC: Matrix Operations | 353–60  358 |  | |  |
| 96–97 | 7.4 Determinants | 361–68 |  | |  |
| 98 | HC: Matrices and Determinants | 369 | Quiz 7B (7.3–7.4) | |  |
| 99 | 7.5 Inverse Matrices | 370–75 |  | |  |
| 100–101 | 7.6 Systems of Inequalities | 376–82 |  | | * understanding the importance of biblical  principles in decision making * using linear programming to make good  decisions, maximize profit, and serve others (Luke 10:33–37; 14:28–30; Prov. 11:24–26;  Matt. 5:16) |
| 102–3 | 7.7 Partial Fractions | 383–88 | Quiz 7C (7.5–7.6) | |  |
| 104 | DA: Cryptology | 389–90 | Quiz 7D (7.7) | | * applying biblical principles in the context  of privacy rights and the need for lawful  investigation |
| 105 | Chapter 7 Review | 391–93 |  | |  |
| 106 | Chapter 7 Test | | | | |

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| Chapter 8 Analytic Geometry | | | | |
| 107–8 | 8.1 Conics and Parabolas | 395–402 |  | * recognizing creative order as a direct result of the preeminence of Christ (Col. 1:17) * knowing the origin of life (Gen. 2:7) |
| 109 | 8.2 Ellipses and Circles | 403–10 |  | * defining eccentricity as a deviation from what God has established (Titus 2:14) |
| 110 | HC: Analytic Geometry | 411 | Quiz 8A (8.1–8.2) | * evaluating René Descartes’s worldview (John 17:17; 2 Pet. 1:16–21) |
| 111 | 8.3 Hyperbolas  TC: Graphing with Desmos | 412–19  419 |  |  |
| 112–13 | 8.4 Rotated Conics | 420–26 |  |  |
| 114 | BPM: Counterexamples and  Existence Proofs | 427–28 | Quiz 8B (8.3–8.4) | * disproving false statements with counter­examples in Scripture (1 Cor. 15:13; John 20:11–18; Luke 24:36–48) * discovering proof of God’s existence in creation  (Rom. 1:20) |
| 115–16 | 8.5 Parametric Representations | 429–34 |  | * using math to enhance public safety |
| 117 | 8.6 Polar Equations of Conics | 435–40 |  |  |
| 118 | DA: Conics in Space | 441–42 | Quiz 8C (8.5–8.6) | * evaluating the universe and human existence from a biblical worldview (Gen. 1:1, 27; Ps. 19:1) |
| 119 | Chapter 8 Review | 443–44 |  |  |
| 120 | Chapter 8 Test | | | |

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| Chapter 9 Sequences and Series | | | | |
| 121–22 | 9.1 Introduction to Sequences and Series  TC: Graphing Sequences | 446–52  453 |  | * appreciating how the golden ratio reflects divine creation |
| 123–24 | BPM: Computer Proofs and Artificial Intelligence  9.2 Arithmetic Sequences and Series | 454–55  456–62 |  | * viewing artificial intelligence from a biblical worldview * assessing unbiblical beliefs relating to artificial intelligence |
| 125–26 | 9.3 Geometric Sequences and Series  HC: Binomial Expansion and Pascal’s Triangle | 463–70  471 | Quiz 9A (9.1–9.2) | * using math to make wise financial decisions (Luke 14:28; Prov. 28:2) * responding to suffering |
| 127 | 9.4 The Binomial Theorem | 472–76 |  | * using probabilities to augment wise  stewardship |
| 128–29 | 9.5 Mathematical Induction | 477–84 | Quiz 9B (9.3–9.4) | * learning about our absolute God * learning a method of implication in truth |
| 130 | DA: Graph Theory and Networks | 485–86 | Quiz 9C (9.5) | * evaluating the proper use of big data |
| 131 | Chapter 9 Review | 487–88 |  |  |
| 132 | Chapter 9 Test | | | |
| 133 | Review for Third Quarter Exam (Chapters 7–9) | | | |
| 134 | Third Quarter Exam | | | |

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| Chapter 10 Descriptive Statistics | | | | |
| 135 | 10.1 Counting Principles | 490–96 |  | * recognizing the high risk of the lottery by using combinatory mathematics |
| 136 | 10.2 Basic Probability | 497–504 |  | * learning how God’s Word and the Holy Spirit provide guidance (Ps. 37:23; James 4:13–15) * affirming that mathematical laws are discovered, not manmade * responding biblically to statistical indicators (Eph. 4:32; Phil. 2:3; James 2:1–7) |
| 137 | DA: Medical Screenings and  Probability | 505–6 | Quiz 10A (10.1–10.2) | * upholding the sanctity of life and caring for others |
| 138 | 10.3 Representing Data Graphically | 507–15 |  | * planning while God directs our steps  (Prov. 16:9) |
| 139–40 | 10.4 Describing Data Numerically | 516–25 |  | * using research to present truth |
| 141 | HC: Political Arithmetic and  Probability | 526 | Quiz 10B (10.3–10.4) | * reflecting on the wisdom and character of God (Rom. 1:19–20) |
| 142–43 | 10.5 Data Distributions | 527–33 |  |  |
| 144–45 | 10.6 Normal Distributions | 534–39 |  | * avoiding unethical use of descriptive statistics |
| 146 | BPM: Mathematical Platonism | 540–41 | Quiz 10C (10.5–10.6) | * comparing Platonism and a biblical perspective of mathematical truth * viewing mathematics as a direct result of God’s creation |
| 147 | Chapter 10 Review | 542–44 |  |  |
| 148 | Chapter 10 Test | | | |

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| Chapter 11 Inferential Statistics | | | | |
| 149–50 | 11.1 Probability Distributions | 546–54 |  | * understanding that statistical interpretation is affected by worldview |
| 151 | 11.2 Central Limit Theorem | 555–64 |  | * understanding that theorems reflect natural laws |
| 152 | HC: Mathematical Expectation | 565 |  | * applying biblical principles to shape worldview |
| 153–54 | 11.3 Confidence Intervals | 566–72 | Quiz 11A (11.1–11.2) |  |
| 155–56 | 11.4 Hypothesis Testing | 573–81 |  | * avoiding bias in research |
| 157 | BPM: Logicism, Intuitionism, and Formalism | 582–83 | Quiz 11B (11.3–11.4) | * examining modern philosophies of  mathematics (1 Cor. 3:11) * understanding that Christ is the foundation of all mathematical truth (Col. 1:15–17) |
| 158 | 11.5 Research Studies | 584–92 |  | * realizing the role of moral values and judgment in inferential statistics |
| 159 | DA: Markov Chains | 593–94 | Quiz 11C (11.5) | * promoting honesty and integrity in computer programming |
| 160 | Chapter 11 Review | 595–97 |  |  |
| 161 | Chapter 11 Test | | | |

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| Chapter 12 Limits, Derivatives, and Integrals | | | | |
| 162 | 12.1 Evaluating Limits | 599–603 |  | * viewing God as the author of infinity * recognizing the limits on our lives (Ps. 90:10) |
| 163 | 12.2 Properties of Limits | 604–9 |  | * comparing mortal lifespan to eternity  (James 4:14; Col. 3:2) |
| 164 | BPM: Mathematics and Infinity | 610–11 | Quiz 12A  (12.1–12.2) | * acknowledging God’s infinite wisdom (Isa. 55:9; Rom. 11:33) * discovering order in creation (Gen. 1:1; Isa. 66:1) * worshipping and praising our infinite God  (Ps. 90:2; 139:1–12) * relating the mathematical concept of infinity to the infinite characteristics of God (Ps. 147:5; 139:7–10; 1 John 3:20; Deut. 33:27; Isa. 40:28; 1 Tim. 1:17; Matt. 19:26; Rev. 19:6; Prov. 15:3) |
| 165–66 | 12.3 Tangents and Derivatives | 612–17 |  |  |
| 167 | 12.4 Basic Derivative Theorems | 618–23 |  |  |
| 168–69 | 12.5 Product, Quotient, and Chain Rules | 624–28 |  |  |
| 170 | DA: Marginal Analysis in Economics | 629–30 | Quiz 12B  (12.3–12.5) | * applying biblical principles in business  (Lev. 25:14; Ps. 112:1–3; Prov. 11:1; Eccl. 5:19;  Isa. 10:1–2; Matt. 25:14–23; 1 Tim. 6:10) |
| 171 | 12.6 Area Under a Curve and  Integration | 631–37 |  |  |
| 172–73 | 12.7 The Fundamental Theorem of Calculus | 638–43 |  | * demonstrating the unity and beauty in God’s created order |
| 174 | HC: The Analyst | 644 | Quiz 12C  (12.6–12.7) | * reflecting the glory of God and His attributes |
| 175 | Chapter 12 Review | 645–46 |  |  |
| 176 | Chapter 12 Test | | | |
| 177–79 | Review for Fourth Quarter Exam (Chapters 7–9) or Second Semester Exam (Chapters 7–12) | | | |
| 180 | Fourth Quarter Exam or Second Semester Exam | | | |