CALCULATOR PROBLEMS

2023

1 - Given a Table of Rate of Change

- Interpretation of Integral in Terms of Units

- Approximation with Right Riemann Sum

- Mean Value Theorem

- New Function - Find Average Value

- Take Derivative

- Interpretation of new function

2 - Given a Function (Rate or v(t))

- Change of Direction

- a(t)

- Speed Up or Slow Down

- Displacement

- Total Distance

2022

1 - Given Function (Rate or f'(x))

- Area

- Average Rate

- Rate Inc/Dec

- Absolute Max/Min

2 - Given Graph of Two Functions

- Find Intercepts

- Area Between Curves

- Distance Between Curves Inc/Dec

- Volume of Cross Sections as Squares

- Rate of Change of Distance Between Curves

2021

1 - Given Table

- Rate of Change or Slope

- Approximation with Right Riemann Sum

- Approximation is Overestimate/Underestimate

- New Function - Find Average Rate of Change = Instantaneous

2 - Given v(t) Functions

- Position

- Moving Towards/Away From Origin

- Acceleration

- Speed Inc/Dec

- Total Distance

2019

1 - Given Entering Rate and Leaving Rate Functions (E(t) and L(t))

- Total Entering

- Average Rate of Entering

- Absolutely Max/Min

- Rate of Change of Inc/Dec

2 - Given Table (Rate)

- MVT

- Approximate by Trapezoid Riemann Sums

- New Function - Distance

- New Function - Displacement

2018

1 - Given a Function (Rate)

- Displacement (Amount Changed)

- Position (Amount at One Point)

- Relative Minimum

- Absolute Minimum

2 - Given v(t) Function

- Acceleration

- Position

- Displacement

- Distance

- New Position Functions - Find Time When Velocities are Equal

2023

3 - Given Differential (dy/dx)

- Tangent Line

- Approximation Using Tangent Line

- Approximation Underestimate/Overestimate

- Particular Solution by Separation of Variables

4 - Given Graph of f'(x)

- Relative Min/Max

- Concavity

- L'Hospital's

- Absolute Min/Max

5 - Given Table of f(x) and f'(x) Values

- Chain Rule

- Product Rule

- Fundamental Theorem of Calculus

- Increasing/Decreasing

6 -Given an Equation

- Implicit Differentiation to Find dy/dx

- Equation for Tangent Line

- Tangent Line Horizontal

- Tangent Line Vertical

- dy/dt = (dy/dx)(dx/dt)

2022

3 - Given Graph of f'(x)

- Area of f(x) Values
- Points of Inflection
- Increasing/Decreasing
- Absolute Max/Min

4 - Given Table

- Approximate Rate of Change
- IVT
- Approximate by Right Riemann Sum
- Implicit Differentiation Using Product Rule

5 - Given Differential

- Slope Field
- Equation for Tangent Line
- Approximation Using Tangent Line
- Underestimate/Overestimate
- Particular Solution by Separation of Variables

6 - Given Position and Velocity Functions

- Velocity
- Acceleration
- Position

2021

3 - Given Function f(x)

- Area of f(x)

- Volume Rotated above x-axis

4 - Given Graph of f(x)

- Fundamental Theorem of Calculus

- Concavity

- Product Rule

- L'Hospital's

- MVT

5 - Given an Equation

- Implicit Differentiation to Find dy/dx

- Equation for Tangent Line

- Line Tangent Horizontal

- Relative Min/Max

6 - Given Differential

- Slope Field

- Interpretation of Limit

- Particular Solution by Separation of Variables

2019

3 - Graph of f(x)

- Area Under Curve

- Area Using Fundamental Theorem of Calculus

- Absolute Min

- L'Hospital's

4 - Given an Equation and a Rate Differential

- Implicit Differentiation to Find Rate

- Particular Solution by Separation of Variables

5 - Given a Graph of Functions

- Area Between Two Curves

- Volume of Cross Sections Given Area Function

- Volume Rotated Around a Horizontal Line Above Functions

6 - Given a Line Tangent to a Graph

- Product Rule with Chain Rule

- L'Hospital's

- IVT

2018

3 - Given Graph of g(x), the Derivative of f(x)

- Evaluate f(x)

- Evaluate Integral of g(x)

- Increasing and Concave Up

- Point of Inflections

4 - Given Table of f(x)

- Estimate Rate of Change of f(x)

- Interpretation of Rate of Change of f(x)

- MVT

- Approximation by Trapezoidal Reimann Sums

- New Function - Differential Rate of Change

5 - Given Function f(x)

- Average Rate of Change

- Slope of the Tangent Line by Product Rule

- Absolute Minimum

- L'Hospital's

6 - Given Differential

- Slope Field

- Equation to the Line Tangent

- Approximate Using Tangent Line

- Particular Solution by Separation of Variables