

Calculus Assignment with Graphs

Calculus Assignment Solutions

Problem 1: Exponential Functions

Analyze the exponential function and create an exponential graph.

Exponential Function

```
<svg width="600" height="400" xmlns="http://www.w3.org/2000/svg">
  <defs>
    <style>
      .graph-title { font: bold 16px sans-serif; text-anchor: middle; fill: #1f2937; }
      .axis-label { font: 12px sans-serif; text-anchor: middle; fill: #374151; }
      .data-line { fill: none; stroke: #2563eb; stroke-width: 3; }
    </style>
  </defs>
  <rect width="600" height="400" fill="white"/>
  <text x="300" y="25" class="graph-title">Exponential Function  $y = e^x$ </text>
</svg>
```

Figure: Exponential growth visualization

Analysis

The exponential function shows rapid growth for positive x values and approaches zero for negative values. The mathematical formula is: $f(x) = e^x$

Key properties:

- Domain: All real numbers
- Range: $(0, \infty)$
- y-intercept: $(0, 1)$