Reading Outline, §6.1

Vocabulary/Definitions

- Antiderivative
- Family of Antiderivatives
- Sketching \( f \) given \( f' \): behavior of \( f \) when \( f' > 0 \), \( f' \) is increasing, etc.
- Using the Fundamental Theorem to find actual values of \( f(x) \) given \( f'(x) \)

Understand

1. Use your calculator to find a graph of \( f(x) = 4xe^{-x} - 1 \) for \( 0 \leq x \leq 5 \) and \(-1 \leq y \leq 1\). Sketch an antiderivative of \( f(x) \) that has \( f(0) = 2 \).

2. Suppose that \( F'(x) \) is given by the following table. Estimate \( F(b) \) at \( b = \frac{1}{2}, 1, \frac{3}{2}, 2, \frac{5}{2}, \) and 3. Use these to sketch \( F(x) \) for \( 0 \leq x \leq 3 \).

<table>
<thead>
<tr>
<th>( x )</th>
<th>0</th>
<th>0.5</th>
<th>1</th>
<th>1.5</th>
<th>2</th>
<th>2.5</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>( F'(x) )</td>
<td>-2</td>
<td>-1.5</td>
<td>-0.25</td>
<td>1</td>
<td>1.5</td>
<td>1</td>
<td>-1</td>
</tr>
</tbody>
</table>