Section 3.3 - Optimization

1. For the following graph of *f* on the interval [1,5]:

Diagram

Description automatically generated

* 1. Identify the value of x and *y* at
     1. The endpoints,
     2. The local maxima,
     3. The local minima,
     4. The points of inflection.
  2. Identify the value of x and *y* at the global max (largest value of *y* on the interval) and determine whether it occurs at an endpoint or a local max.
  3. Identify the value of x and *y* at the global min (smallest value of *y* on the interval) and determine whether it occurs at an endpoint or a local min.

1. For the following graph of *f* on the interval [1,5]

Diagram

Description automatically generated

* 1. Identify the value of x and *y* at
     1. The endpoints,
     2. The local maxima,
     3. The local minima,
     4. The points of inflection.
  2. Identify the value of x and *y* at the global max (largest value of *y* on the interval) and determine whether it occurs at an endpoint or a local max.
  3. Identify the value of x and *y* at the global min (smallest value of *y* on the interval) and determine whether it occurs at an endpoint or a local min.

1. For the functions A-D below:
2. Find the formula of f’ and f’’.
3. Find the values of x where f’ and f’’ are equal to zero.
4. Create a numberline with the signs of f’ and f’’ as done in class
5. Find the points of inflection, local maxima and minima
6. Find the value of *f* at the interval endpoints
7. Determine the global max and global min
8. Draw the graph of *f* on the interval labeling the local and global max/min as well as the pts of inflection. (feel free to check with Desmos)
9. on the interval [-4, 3]
10. on [0,2pi]
11. on [-2,4]
12. on [-1,5]
13. The error function for a positioning algorithm is given by

where *h* is the distance of the camera from an object and *f(h)* is the error in the position that the algorithm returns. Given that

1. What is the optimal distance for the camera?
2. What is the worst possible distance to place the camera?