

Calculus BC

Section 3.6 - A Summary of Curve Sketching

Obj: -To graph a function

1. Graph after finding the critical points, local max & min, and inflection points.

$$f(x) = x^3 - 3x^2 + 4$$

1st derivative:

- find f'
- solve $f' = 0$ to find critical points

2nd derivative:

- find f''
- solve $f'' = 0$ to find inflection points

←————→ f'

←————→ f''

Graphing checklist:

-x-intercept

-y-intercept

-Vertical Asymptote

-Horizontal Asymptote

-Oblique asymptote: If the degree of the numerator is one greater than the degree of the denominator, then the graph will have an oblique asymptote.
-use long division to find the oblique asymptote.

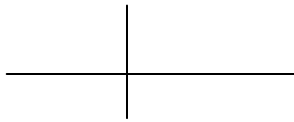
-Critical numbers

-Points of inflection

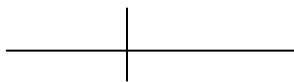
-Domain (of f , f' , f'')

-Symmetry:

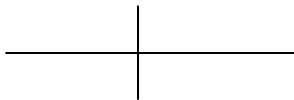
a) about the x-axis: equation unchanged when (x, y) is replaced by (\quad, \quad)



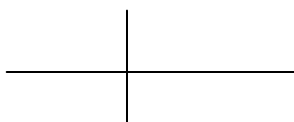
b) about the y-axis: equation unchanged when (x, y) is replaced by (\quad, \quad)



c) about the origin: equation unchanged when (x, y) is replaced by (\quad, \quad)



d) about the line $y = x$: equation unchanged when (x, y) is replaced by (\quad, \quad)



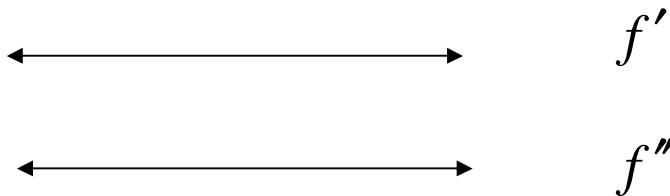
2. Graph $f(x) = x^{2/3}$

1st derivative:

- find f'
- solve $f' = 0$ to find critical points

2nd derivative:

- find f''
- solve $f'' = 0$ to find inflection points



3. Graph $f(x) = \frac{x^2 - 2x + 4}{x - 2}$

-x-intercept

-y-intercept

-Vertical Asymptote

-Horizontal Asymptote

-Oblique asymptote

-Domain of f

-Critical numbers

-Domain of f'

-Points of inflection

-Domain of f''

-Symmetry

4. Graph $f(x) = \frac{2(x^2 - 9)}{x^2 - 4}$

-x-intercept

-y-intercept

-Vertical Asymptote

-Horizontal Asymptote

-Oblique asymptote

-Domain of f

-Critical numbers

-Domain of f'

-Points of inflection

-Domain of f''

-Symmetry

5. Graph $f(x) = 2x^{5/3} - 5x^{4/3}$

-x-intercept

-y-intercept

-Vertical Asymptote

-Horizontal Asymptote

-Oblique asymptote

-Domain of f

-Critical numbers

-Domain of f'

-Points of inflection

-Domain of f''

-Symmetry