

Math 1A: Quiz 7 Questions

Jeffrey Kuan

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Question 1

Find the following information for the function

$$f(x) = \frac{x^3}{x^2 - 1}$$

and use it to curve sketch the function.

- Domain
- Zeros
- Vertical asymptote, horizontal asymptote, and slant asymptote (if applicable)
- Where the function is increasing/decreasing
- The location of all local maxima and minima
- Where the function is concave up and concave down
- The location of all inflection points

Question 2

Find the following information for the function

$$f(x) = e^{-1/x}$$

and use it to curve sketch the function for values $x > 0$.

- Zeros, if any
- The limits $\lim_{x \rightarrow 0^+} f(x)$ and $\lim_{x \rightarrow \infty} f(x)$.
- Where the function is increasing/decreasing
- The location of all local maxima and minima
- Where the function is concave up and concave down
- The location of all inflection points

Question 3

Find the following information for the function

$$f(x) = \frac{\ln(x)}{x}$$

and use it to curve sketch the function.

- Domain
- Zeros
- Vertical asymptote, horizontal asymptote, and slant asymptote (if applicable)
- Where the function is increasing/decreasing
- The location of all local maxima and minima
- Where the function is concave up and concave down
- The location of all inflection points

Question 4

Find the following information for the function

$$f(x) = x^{5/3} + 5x^{2/3}$$

and use it to curve sketch the function.

- Domain
- Zeros
- Where the function is increasing/decreasing
- The location of all local maxima and minima
- Where the function is concave up and concave down
- The location of all inflection points

Question 5

Show that the function $y = \cos(x) + 2x$ has exactly one zero.

Question 6

Show that the function $y = x^3 + 2x + 10$ has exactly one zero.