

Calculus 1 Exam 3 Review Problems

1. Let $f(x) = x(x - 2)^3$.

1. Determine the intervals of increasing and decreasing, critical points and local extrema of the function .

(a) Written Solution

(b) Video Solution

2. Determine the intervals of concavity and inflection points.

(a) Written Solution

(b) Video Solution

3. Provide a graph of the function.

(a) Written Solution

(b) Video Solution

2. Find the absolute maximum and minimum of the function $f(x) = \frac{x^3}{3} - x + 2$ on the interval $[0, 3]$

1. Written Solution

2. Video Solution

3. Determine

1. $\lim_{x \rightarrow 1} \frac{\ln(x)}{x-1}$

2. $\lim_{x \rightarrow 0} \frac{\cos(x)-1}{x^2}$

3. $\lim_{x \rightarrow \infty} x \ln\left(1 + \frac{2}{x}\right)$

4. $\lim_{x \rightarrow 0} x^x$

1. Written Solution

2. Video Solution

4. I recently decided that I wanted to start a garden in my back yard. While I don't have a huge back yard, I should have enough room to make a small garden and grow a few plants. When I looked in my shed I found 24 feet of usable fencing that I can use to enclose my garden. Furthermore, I already have a fence around my back yard, so I will use that fence for one of the sides of the rectangular garden I plan to make. Before digging up the grass and tilling the soil, I want to know what dimensions I should make the garden to ensure that I have the largest area available for planting.

1. Written Solution

2. Video Solution

5. Sketch the function $f(x) = \frac{x^2-9}{x^2-2x-3}$. Label all pertinent information. Note that

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

$$f''(x) = \frac{4(x-3)}{(x+1)^3(x-3)}$$

1. Written Solution

2. Video Solution