

MAT 129 – 002, 003
Fall 2009
Review for Test three
Show all work.

1. Determine the absolute maximum and absolute minimum on the interval $[-1, 4]$ for the function $y = x^3 - 3x^2$.

2. Find the critical point(s) and inflection point(s) of the curve given by $y = x^4 - 4x^3$.

3. A farmer plans to fence a rectangular pasture adjacent to a river. The pasture must contain 180,000 square meters in order to provide enough grass for the herd. What dimensions would require the least amount of fencing if no fencing is needed along the river? (Cows don't like to swim.) Show that the length of the fence is a minimum.

4. Find f . $f''(x) = x - \cos x$. $f'(0) = 2$ and $f(0) = -2$.

5. Describe the area represented by $\lim_{n \rightarrow \infty} \sum_{k=1}^n \frac{3}{n} \times \left(2 + k \times \frac{3}{n}\right)^4$.

6. Write an expression to estimate $\int_2^5 f(x) dx$ using $n = 6$ left endpoint rectangles.

7. Determine $\int_1^3 (4x^{3/2} + x^{7/2}) dx$.

8. $g(x) = \int_0^{x^2} \sin^2 t \, dt$. Determine $g'(x)$.

9. Determine $\int \frac{x^3}{(x^4 + 1)^4} dx$.

10. Determine $\int \sin^2 x \cos x \, dx$.

11. Determine $\int_1^2 (x+1)(x^2 + 2x)^3 \, dx$.

12. Determine $\int_{-1}^2 \sqrt{5x+6} \, dx$.