

Midterm 1

The exam has a total of 40 points. Show all your work. Good luck.

1.- (5 points) Find the average rate of change of $f(x) = e^{-2x}$ between $x = -10$ and $x = 0$. Illustrate your answer graphically.

2.- (5 points) Sketch the graph of the function $y = 4 \cos 2x$. What are its amplitude and period?

3.- (5 points) Let $f(x) = x^2 + 1$ and $g(x) = \ln x$.

(a) Find $g(f(x))$.

(b) Sketch the graph of $g(f(x))$.

4.- (5 points) Find the equation of the line passing through the points $(0, -1)$ and $(2, 3)$. Sketch the graph of this line.

5.- (10 points) A company produces and sells socks. The fixed costs are \$7,000 and the variable costs are \$5 per sock.

(a) Socks are sold for \$12 each. Find the cost and revenue as functions of the quantity of socks, q .

(b) The company is considering changing the selling price of the socks. Demand is $q = 2000 - 40p$, where p is the price in dollars and q is the numbers of socks. What quantity is sold at the current price of 12 dollars? What profit is realized at this price?

(c) Use the demand equation to write cost and revenue as functions of the price, p . Then write profit as a function of price.

(d) Graph profit against price. Find the price the maximizes profits. What is this profit?

6.-(10 points) A deposit of \$100 is made in to an account paying a nominal yearly interest rate of 8 %. Determine the amount in the account in 10 years if the interest is compounded:

- (a) Anually
- (b) Monthly
- (c) Weekly
- (d) Daily
- (e) Continuously