1. When production is 2000, marginal revenue is $4 per unit and marginal cost is $3.25 per unit. Do you expect maximum profit to occur at a production level above or below 2000? Explain
2. During a flu outbreak in a school of 763 children, the number of infected children, *C*, was expressed in terms of the number of susceptible (but still healthy) children, *S,* by the expression:

*C* = 192 ln ( S/762) – S +763

What is the maximum possible number of infected children?

1. The demand equation for a product is p= 45 - .003q. Write the revenue as a function of q and find the quantity that maximizes revenue.
2. Find the global maximum and minimum of the function y= x^2 + 3x for x>1. (1, +∞)
3. ∫3x lnx dx
4. ∫e-2x(2x-3)1/2dx
5. ∫ (16x)(e4x^2) dx
6. ∫ (17x)/(8x2+e) dx
7. ∫ (1/x + 3/x^2 - e^x + 2x)
8. ∫ (13x^3)/(2x^4 - **π**)
9. What is the antiderivative of the following functions:
10. *f*(x) = 25e-0.05
11. *g*(x)= 4x4 + 3x3 +2x2 + x
12. *h*(x) = e-4x
13. *f*(x) =
14. ∫2x e2x dx
15. Use the first derivative test to find all critical points and use the second derivative test to find all inflection points. f(x)=x5-5x3+5x-25 (Peter Kleinberg)
16. The function f(x)=x5-5x4+35 has critical points at x=0 and x=4.  Use a sign chart to determine which of these values is a local maximum and which of these values is a local minimum.
17. Find the global maximum and minimum of f(x) = x^2-ln(5x) for x in [1,5].
18. The demand equation for sunglasses is p=46-0.04q. Write a revenue equation, then, find the quantity and price that maximizes the revenue of sunglasses.
19. Revenue is given by R(q) = 487q and cost is given by C(q) = 30,000 + 4q^2. At what quantity is profit maximized? What is the profit at this production level?
20. Find the exact global maximum and minimum values of the function. If there is no global minimum or maximum then answer none.

f(x) = x + lnx for x > 0.

1. ∫(2x+2)ex^2+2x+3dx
2. ∫x2ln(x+2)
3. ∫16dx/3x-45
4. ∫ (5ylny dy)
5. ∫ (z+1)e8z dz
6. The demand equation for a product is p= 26-.01q. Write the revenue as a function of q and find the quantity that maximizes the revenue.
7. Find the global max/min of f(x)= x-lnx for x=[1,e]
8. Find the critical and inflections points for: f(x)= 5x2-2x+7 for -5<x<5; using the first derivative test. Then determine if the point(s) is(are) a max, min, or neither.