



PRINCE SULTAN UNIVERSITY

MATH 211

BUSINESS CALCULUS

MAJOR EXAM III 12TH January 2010

Start : 4:30 PM

End: 6:00 PM.

Name: _____ I.D. _____

1. Answer all questions
2. This exam consists of 4 pages, 9 questions
3. You can use a calculator, NOT a mobile phone.
4. No talking during the test.
5. Show all working out in the space provided.

Question No.	Max. Points	Points Scored
1, 2, 3, 4	19	
5, 6	13	
7, 8, 9	18	
TOTAL	50	

Q1. (5 points) An investment firm estimates that the value of its portfolio after t years is $A(t) = 300\ln(t + 3)$ million dollars.

a) What is the value of the account after 2 years?

b) How long does it take before the account is worth 500 million dollars?

Q2. (4 points) A certain industrial machine depreciates so that its value after t years becomes $Q(t) = 2000te^{-0.4t}$ dollars.

At what rate is the value of the machine changing with respect to time after 5 years?

Q3. (6 points) The marginal revenue derived from producing q units of a certain commodity is $MR = 4q - 1.2q^2$ \$ per unit. If the revenue of producing 20 units is \$30,000, how much revenue should be expected from producing 40 units?

Q4. (4 points) Let $\int_{-2}^4 f(x)dx = 5$, $\int_{-2}^4 g(x)dx = 4$, $\int_{-2}^6 f(x)dx = -20$.
Evaluate the following integral:

a) $\int_{-2}^4 3f(x) - 4g(x)dx =$

b) $\int_6^4 f(x)dx =$

Q5. (8 points) Evaluate the following integral

a) $\int (5e^x - \frac{5}{2x} + \ln 2) dx$

b) $\int \ln(e^{4x^3-2}) dx$

c) $\int 3x(5x^2 - 4)^{10} dx$

d) $\int_0^4 \sqrt{6x+1} dx$

Q6. (5 points) The marginal cost of producing q units of a certain commodity is $MC = 8q + 2$ \$ per unit. What is the total cost of producing the first 10 units?

Q7. (5 points) Find the area of the region bounded by $y = x^2 + 1$ and $y = 2x - 2$ over $-1 \leq x \leq 1$.

Q8. (5 points) A company determines that if L worker-hours of labour are employed, then $Q(L) = 500L^{2/3}$ units of a particular commodity will be produced. What is the average production as labour varies from 1000 to 2000 worker-hours?

Q9. (8 points) Find the consumers surplus for a commodity whose demand function is $D(q) = \frac{500}{0.4q + 3}$ dollars per unit if the number of demanded units is 5 units.