Assignment # 1

স্কুল অব বিজনেস

BBA 1304

Bangladesh Open University

BBA Program

Semester: 221 (1st Level)

For ONLINE Review Class!

Join WhatsApp GROUP:

https://chat.whatsapp.com/J93eUaZ3jNI7X4hzh0wqPm

Course: Business Mathematics **Due on: 24 May, 2024**

(Assignment is to be presented in own handwriting on A4 size white pages)

Note: Answer all the questions and submit to the coordinator of your tutorial center on or before due date.

INSTRUCTIONS

https://youtu.be/pYi7bBZ2jjY

1.1. Identify which of the following relationships can be considered as functions and why? If not, convert them into functional form (use notations).

i. Sickness and medicine.
ii. Social Media and internet.
iii. Books and knowledge.
iv. Success and hard work.
v. Fuel and machine.
vi. Employment and educational degrees.
vii. Animal and oxygen.
viii. Income and Education.
ix. Weather and production of tomato.
x. Quantity demanded and price.
xi. Nutrition and learning.
xii. Training and skills.

1.2. Identify the type of the following functions:

i) $Y= (X+2)(3X-3)$
ii) $Y=5^{(2X)}$
iii) $Y= e^{\ln X}$
iv) $Y=\ln x^2$
v) $Y=5X^3+3X^2-10X+10$

1.3. What is intercept? Find the X-intercept and Y-intercept of the following functions:

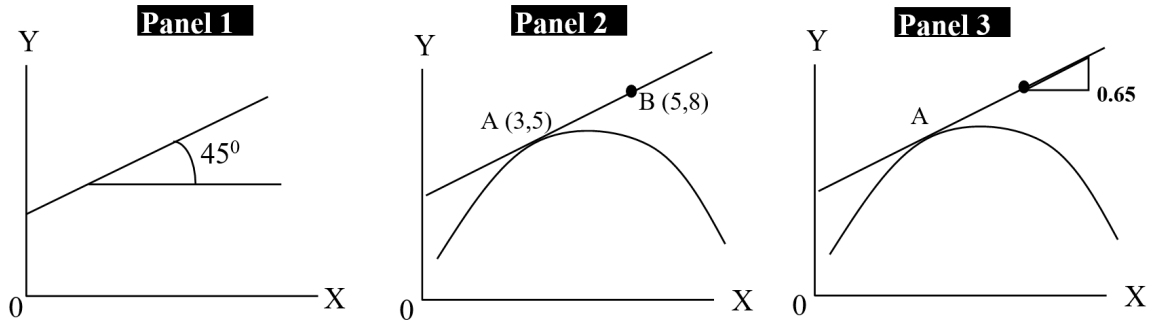
i) $Y= 5X+6$

ii) $Y= 5X^2+15X+4$
iii) $Y= 12e^X+3$ [Y-intercept only]

1.4. Draw the graphs of the following functions. You may use Symbolab or any other online application to check the accuracy of the shapes of the graphs.
i) $Y= 10X+4$
ii) $Y= 3X^2-7X+4$
iii) $Y=2e^{5X} + 3$

https://www.symbolab.com/graphing-calculator

1.5. Find the equation of the line in Panel 1, the slope of the curve at point A in Panel 2 and slope of the curve at point A in Panel 3.



1.6. Prove that $\ln 25 \times \log_5^{10} - \ln 100 + \log 30 - \log 3 = 1$ [do not use calculator].

1.7. If A = {1, 2, 3, 4}, B = {2, 4, 6, 8} and C = {3, 4, 5, 6}, Find –
(i) $A \cup B$, (ii) $B \cup B$, (iii) $(A \cup B) \cup C$, (iv) $A \cup (B \cup C)$.

1.8. By using Venn Diagram, prove the following –

(i) $A \cap (B \cap C) = (A \cap B) \cap C$ (ii) $(A \cup B)^c = A^c \cap B^c$

1.9. What is the difference between differentiation and derivative? Differentiate the following functions with respect to X:
i) $Y= 6X+3$
ii) $Y= 7X^2+6X+5$
iii) $Y= (X+2)(3X-3)$
iv) $Y=5^{(2X)}+6$
v) $Y= e^{\ln X}$
vi) $Y=\ln x^2$
vii) $Y=5X^3+3X^2-10X+10$

1.10. Find which of the following are increasing or decreasing functions at X=2:
i) $Y= 2X+5$
ii) $Y= 3X^2+6X+5$
iii) $Y= 3e^{X+2}+10$
iv) $Y=\ln X^2$

Assignment # 2

স্কুল অব বিজনেস

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Bangladesh Open University

BBA Program

Semester: 221 (1st Level)

Course: Business Mathematics **Due on: 12 July, 2024**

(Assignment is to be presented in own handwriting on A4 size white pages)

Note: Answer all the questions and submit to the coordinator of your tutorial center on or before due date.

2.1. Suppose the cost function of a company is $C=6Q^2+ 5Q +100$. Find the following:
   i) Marginal cost (MC) function
   ii) Average cost (AC) function
   iii) Average fixed cost at Q=1
   iv) Average variable cost at Q=2

2.2. Find the slope and convexity/concavity of the following functions at X=2:
   i) $Y=2X^2 – 16X + 50$
   ii) $Y= X^2 + 8X + 15$

2.3. Find the critical points of the following functions and identify the nature of the critical points (maximum, minimum or point of inflection):
   i) $Y= 10X^2- 40X+100$
   ii) $Y= -2X^2 - 16X + 70$

2.4. Suppose the demand Function is P= 40- Q and cost function is $C = 10Q + 2Q^2$. Find the following:
   i) Marginal revenue (MR) function
   ii) Profit maximizing output level

2.5. [COMBINATION] A committee of 7 is to be formed from 14 students. How many different ways this can be done so as always to (i) include 1 particular student; and (ii) exclude 2 particular students?

2.6. [PERMUTATION] Indicate how many 4-digit numbers greater than 8000 can be formed from the digits 2, 4, 5, 6, 8, 9 where digits are not repeated?

2.7. [PERMUTATION] Find the number of arrangements that can be made out of the letters of the word "PERMUTATION" where first letter will be always P and last letter will be N.

2.8. [COMBINATION] A group of 11 students is to be formed from 35 students of MAT100 Course where there are one renowned singer, two debaters and a national cricket player. How many different ways this can be done so as always to (i) include 1 singer and 1 debater; and (ii) exclude singer and debaters?

2.9. Define square matrix, diagonal matrix and scalar matrix. “All scalar matrices are diagonal matrices, but all diagonal matrices are not scalar matrices” – do you agree with the statement? Give examples.

2.10. Find AB following matrices. Is AB a symmetric matrix?

i. $A=\begin{bmatrix}3 & 2 & 0\\ 1 & 2 & 1\\ 1 & 0 & 3\end{bmatrix}$ ii. $B=\begin{bmatrix}1 & 3 & 2\\ 0 & 1 & 1\\ 2 & 2 & 3\end{bmatrix}$

2.11. Given the following equation system with variables X, Y and Z.

$2X+2Y+Z+3 = 0$

$X + 3Y - 2Z = 1$

$3X - Y - Z = 2$

Find the following:

(i) Value of the co-efficient matrix.

(ii) Solve the equation system for X, Y & Z by using inverse matrix.

(iii) Solve the equation system for X, Y & Z by Cramer's Rule.

(iv) Prove that results in 2.11 (ii) and (iii) are same.

2.12. **SELF-CHECK Quiz 1** [Compulsory, Minimum Acceptable Score: 70%]

Please click on the following LINK or Scan QR Code for the QUIZ 1. It must be submitted online; otherwise, you assignment will not be evaluated. **Add the hardcopy of the Score Card with your assignment.**

https://testmoz.com/q/13625726