
Business Mathematics I

Name: Number: Section:

Instructions:

- (i) Give your complete, mathematically correct and neatly written solution for each question.
 - (ii) Only one question will be graded and the grader can choose any question for grading.
 - (iii) The due date for submitting your solution is Tuesday, April 21 (class time). However, it is recommended that you finish this homework before April 21.
 - (iv) A short quiz out of this homework will be given on Tuesday, April 21.
 - (v) Copying someone else's homework is considered cheating/plagiarism and the minimum penalty is zero in the homework.
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Q1: Four years ago, Fatima was twice as old as her brother. Find the present age of Fatima and her brother if the product of their ages today is 160.

Q2: The cost of publishing each copy of a daily newspaper is 100 Baisa. The revenue from the sales of each copy is 200 Baisa, and the revenue from advertising is 20% of the revenue obtained from sales excess of 1000 copies.

- (i) How many copies must be published and sold each day to earn a daily profit of 100 Rials.
- (ii) How many copies must be published and sold each day to earn a a daily profit of 200.10 Rials.
- (ii) How many copies must be published and sold each day to earn a a daily profit of at least 200.10 Rials.

Q3: If $x = -1, 1$ are the two roots of the equation $x^2 + ax + b = 0$, then find the values of a and b .

Q4: Solve each one of the following inequalities and write your solution whenever possible in interval form:

- (i) $2x - 3 \leq 1 + x < 3x - 1$.
- (ii) $x^2 - x - 5 > 1$.
- (iii) $|3x - 2| > 2x - 3$.

Q5: Find the x -intercept of the line that passes through the point $(1, 2)$ and perpendicular to the line joining $(1, 1)$ and $(3, 4)$.

Q6: Mohammaed bought a new car for 7500 Rials. If it depreciated linearly by 750 per year and if it has a scrap value of 200 Rials.

- (i) For how long would the car be in use?
- (ii) What was the value of the car after t years?
- (iii) What is the car worth after 3.5 years?

Q7: For a particular commodity, the supply relation is

$$x = \begin{cases} 6p & \text{if } 0 \leq p \leq 1 \\ \frac{6}{p} & \text{if } p \geq 1 \end{cases}$$

and the demand relation is $x + 2p = 7$. Find the points of market equilibrium. Graph the supply and demand equations.

Q8: Consider the function $f(x) = -x + b$, where b is a constant.

- (i) What is the domain of $f(x)$?
- (ii) Find $f(\frac{b}{2})$. What about $(f \circ f)(\frac{b}{2})$?
- (iii) Find each of $f(10)$, $(f \circ f)(10)$, $(f \circ f \circ f)(10)$, $(f \circ f \circ f \circ f)(10)$. What do you observe?
- (v) For a constant c , find each of $f(c)$, $(f \circ f)(c)$, $(f \circ f \circ f)(c)$, $(f \circ f \circ f \circ f)(c)$. What do you observe?

Q9: Solve each of the following equations:

- (i) $\log(x + 3) - \log(x - 1) = \log(1 - x)$.
- (ii) $e^{2x} - 4e^x - 5 = 0$.

Q10: Every year, Khalid invests 2500 Rials in a saving account that earns interest at 8% per annum. Find the value of the investment on the 15th anniversary of the first deposit.

Good Luck