Math – Quiz 7 (10 marks)

Student's Name: _____

Grade 11th

مدارس البكالوريا
BACCALAUREATE SCHOOLS

30th November, 2025

**Q1) A tech startup is tracking its monthly revenue and monthly operating costs.**

- The company notices that **revenue increases by 50,000 currency units every month, starting from 80,000 units in the first month**.
- Meanwhile, as the company grows, its operating costs accelerate: they start at 60,000 units, but the monthly cost increases follow a quadratic pattern, rising faster each month due to scaling expenses: $\boldsymbol{C(t) = 10,000t2 + 60,000}$

1- Write an equation for the company's monthly revenue based on the information above.

2- Use the equations to find the month (i.e. 2nd, 3rd …etc.) when the company breaks even (i.e. no profit nor loss)

3- Relative to the breakeven month, is the company profiting before or after that month? **Explain**.

4- Explain how changing the monthly revenue growth rate (the slope of the revenue function) would affect the company's profitability.

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**Q2) Describe the following polynomial: degree, x-intercepts, y-intercept, roots multiplicities, turning points, end behavior. Then sketch an approximate graph on the provided grid (you can scale the axes as needed)**

$$g(x) = 2x^4 + 2x^3 - 18x^2 - 18x$$