In this assessment, you need to solve problems related to your school of study. Provide detailed steps wherever required. Also, support each solution with an appropriate rationale. In other words, always show your work.

School of Nursing

1. (35 points) A hospital is planning to start a new fitness program for the surrounding community. The fixed monthly cost of the program will be $10,000, and it will cost the hospital $15 per person. This includes all equipment, trainers, nutritionists, and lunch for all attendees.
    a. Write the cost function, *C*, of running the program for x number of people.
    b. Write the average cost function, $\bar{C}$, of running the program for x number of people.
    c. Find and interpret the following:
        i. $\bar{C}(20)$
        ii. $\bar{C}(500)$
    d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the hospital.
2. (35 points) Describe the steps of finding a parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

School of Electronics Technology

1. (35 points) An electronics company is planning to produce a new, specialized calculator for a very large, nationwide financial company. The fixed monthly cost of production will be $18,000 and it will cost $8 per calculator. This includes the product, technical support, and a two-year warranty on each calculator.
    a. Write the cost function, *C*, of producing x number of calculators.
    b. Write the average cost function, $\bar{C}$, of producing x number of calculators.
    c. Find and interpret the following:
        i. $\bar{C}(200)$
        ii. $\bar{C}(1500)$

d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the company.

2. (35 points) Describe the steps of finding a parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

School of Information Technology

1. (35 points) A large technology company is planning to start a new technical support program. The fixed monthly cost of the program will be $22,000 and it will cost $150 per user. This includes all equipment, 24-hour technical support, and bi-weekly workshops.
    a. Write the cost function, C, of running the program for x number of people.
    b. Write the average cost function, $\bar{C}$, of running the program for x number of people.
    c. Find and interpret the following
        i. $\bar{C}(100)$
        ii. $\bar{C}(2000)$
    d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the company.
2. (35 points) Describe the steps of finding parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

School of Drafting and Design

1. (35 points) A construction company is planning to start a new program that builds small, hut-like clinics for underdeveloped countries. The fixed monthly cost of the program will be $35,000 and it will cost $250 per clinic. This includes all building materials, recycled wood shingles, and two built-in cots.
    a. Write the cost function, *C*, of running the program for x number of clinics.
    b. Write the average cost function, $\bar{C}$, of running the program for x number of clinics.
    c. Find and interpret the following:
        i. $\bar{C}(50)$

ii. $\bar{C}(2500)$

d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the company.

2. (35 points) Describe the steps of finding a parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

School of Business

1. (35 points) An employment agency is planning to create a transferable skills program for the surrounding community. The fixed monthly cost of the program will be $6,000 and it will cost $35 per person. This includes licensed professionals, computer and internet access, and lunch for all attendees.
    a. Write the cost function, *C*, of running the program for x number of people.
    b. Write the average cost function, $\bar{C}$, of running the program for x number of people.
    c. Find and interpret the following:
        i. $\bar{C}(15)$
        ii. $\bar{C}(250)$
    d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the company.
2. (35 points) Describe the steps of finding a parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

School of Criminal Justice

1. (35 points) A county with high crime rate is planning to start a crime watch program for the surrounding community. The fixed monthly cost of the program will be $9,000 and it will cost $25 per household. This includes new security cameras at every intersection, alarm systems for each house, 24-hour security hotline, and installation of emergency phones located throughout the neighborhood.
    a. Write the cost function, *C*, of running the program for x number of households.

b. Write the average cost function, $\bar{C}$, of running the program for x number of people.

c. Find and interpret the following:

   i. $\bar{C}(20)$

   ii. $\bar{C}(150)$

d. What is the horizontal asymptote for the graph of the average cost function, $\bar{C}$? Describe what this represents for the company.

2. (35 points) Describe the steps of finding a parabola's vertex if its equation is in the form $f(x) = ax^2 + bx + c$. Use $f(x) = x^2 - 6x + 8$ as an example.
3. (30 points) Describe the steps of finding the possible rational zeros of a polynomial function.

Submission Requirements:

Submit your answers in a Microsoft Word document. Name the document **MA1210_nn_Ex5-1.docx**, replacing **nn** with your initials. Cite all the sources of your reference in APA format.

Evaluation Criteria:

Your submission will be evaluated against the following criteria:

- Did you include appropriate steps and any formulas or properties to determine the answers to questions, wherever required?
- Did you correctly answer each question?
- Did you provide real-life examples in all research questions?
- Did you cite all sources of information in APA format?
- Did you submit answers in an organized fashion that was legible and easy to follow?