Homework#

School of Engineering

AUD AMERICAN UNIVERSITY IN DUBAI

Course Code: ENGG 255	**Course Name: Engineering Design and Economics**
Semester & Year: Spring 2019	**Date: Sunday March 31, 2019**
Instructor: Dr Sadegh Babaii	**DUE Date: April 4, at 4 pm by pdf file**

Name: Wadad Ghorab	**ID: 1604028696**
Signature:	**Major: Mechanical**

Directions

- Provide your answer to each of the following problems. You must clearly and neatly show your work in the provided space after each problem to qualify for full credit.
- Homework should be submitted with this booklet.
- One objective of your homework is to communicate, so neatness counts. 20% will be deducted for lack of neatness or not following the directions.
- Late submissions will not be accepted.
- Solve these problems on your own, by hand,
- Notes and textbook are allowed.
- Your work must be original: no copying from any other term or any other class, and no copying from any classmate.

*By signing above you confirm that the submission has been fully prepared by you. Any suspicion of copying or plagiarism in this work will be reported to the Dean or Chair for appropriate investigation and appropriate disciplinary actions, which may result in a "0" on the work, an "F" in the course or other penalties as described in the *Student Handbook*, which can be found online at: http://www.aud.edu/files/StudentHandbook.pdf

Soft copy by pdf file only

Email. sbabaiikochekseraii@aud.edu

Pets care and medical devices is becoming the new hit in the global market. PuRrrr ltd. Is designing a new GPS location monitoring service for cats that has the following per unit costs to manufacture and per unit selling price to make a profit per month of $36,000.

Monthly cost distribution	A
Selling price per unit	$150
Variable cost per unit	$45
Fixed cost	$45,000

X = units

1. Set up the equations describing the total costs

Total cost = Variable cost + fixed cost = 45,000 + 45x
Total revenue = selling price per unit x number of units = 150x

2. Calculate the cost-revenue breakeven point and draw scaled cost-revenue graph

Breakeven: cost = revenue;
45,000 + 45x = 150x
45,000 = 105x
428.57 units = x

$64,200 is the breakeven point

3. The number of units to be sold every month to reach the profit goal

Profit = Total revenues – total costs
36,000 = 150x – (45,000 + 45x)
81,000 = 105x
771 units to be sold per month = x

4. Define Sunk costs. State 2 examples

Sunk cost: It is the cost already spent previously. When analyzing problems, sunk cost should not be included as the money has already been used and is unable to change.
Example 1: money already spent on machinery and equipment
Example 2: money already spent on previous maintenance

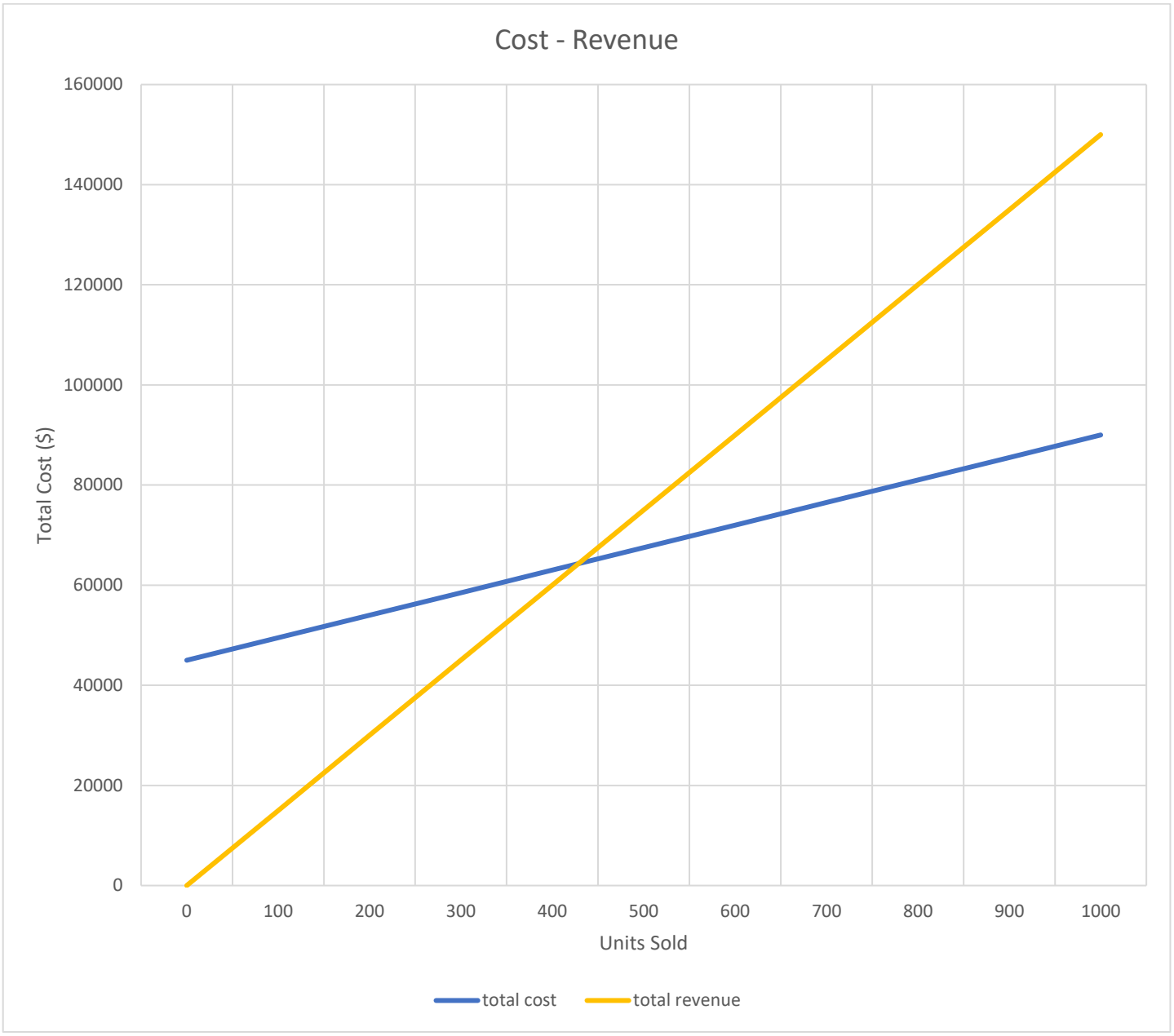
5. In the course project, you have to develop price index to calculate the price of a NEW Ferrari Daytona 1987 model based on the original price in 1973. What was the price in 1973? What is the price index for 1987 if the index in 1973 was 10? Show all calculations.

Price in 1973: $740,000 (€562,485)
Price in 1987: $2,377,271 (€1,807,000)

$$\frac{\text{cost at time A}}{\text{cost of time B}} = \frac{\text{index A}}{\text{index B}}$$

$$\frac{2{,}377{,}271}{740{,}000} = \frac{\text{price index for 1987}}{10}$$

Price index for 1987 = 32.13


Cost - Revenue
160000
140000
120000
100000
80000
60000
40000
20000
0
Total Cost ($)
0
100
200
300
400
500
600
700
800
900
1000
Units Sold
total cost
total revenue

Name: ID: