<u>Q2.</u>) Given an initial investment of $50,000, and an annual revenue of $7,791 for 10 years, calculate the Internal Rate of Return for this project. *Hint: No interpolation required*

$$PV = P + A(\tfrac{P}{A}, i, N) = -50000 + 7791(\tfrac{P}{A}, i, 10) = 0$$

$$(\tfrac{P}{A}, i, 10) = \tfrac{50000}{7791} = 6.417$$

IRR ≈ 9%

<u>Q9.</u>) As the CEO of a local business, you are considering purchasing an electric company car rather than using UBER. Your company's MARR is 15%.

The electric vehicle you want has an initial cost of $26,000, and will be used for 3 years, then sold at a salvage value of $8,000. The annual savings from this investment will be $0.29 per mile driven.

What is the minimum annual travel in miles required for you to break even?

Hint: It is easiest to solve using AW and No interpolation is required

$(\tfrac{A}{P}, 15\%, 3) = 0.4380$ $(\tfrac{A}{F}, 15\%, 3) = 0.2880$

$margin = revenue - costs = 0.29 - 0 = \$0.29/mile$

Set NPV = 0

$$AW = -P(\tfrac{A}{P}, i, N) + A + F(\tfrac{A}{F}, i, N) = -P(\tfrac{A}{P}, i, N) + (volume * magin) + F(\tfrac{A}{F}, i, N)$$

$$-26000(\tfrac{A}{P}, 15\%, 3) + (volume * 0.29) + 8000(\tfrac{A}{F}, 15\%, 3) = 0$$

$$-26000(0.4380) + (volume * 0.29) + 8000(0.2880) = 0$$

$$-11388 + (volume * 0.29) + 2304 = 0$$

$$(volume * 0.29) = 9084$$

volume = 31, 324. 14 miles

<u>Q11.</u>) Drones-R-Fun is considering a new drone product line. The initial investment is $26,337,166, annual revenues are $5,398,408 and annual maintenance is $787,107. Assume a 10% MARR and a project life of 5 years.

Using Annual Worth (AW), determine the **B/C Ratio** of this program.

NOTE: Calculate the **B/C Ratio** correctly to two decimal places.

A = 5,398,408 - 787,107 = 4,611,301

$$AW_{benefits} = A = \$4,611,301$$

$$AW_{costs} = -P(\tfrac{A}{P}, 10\%, 5) = 26337166(0.2638) = \$6,947,744.39$$

$$BCR = \frac{\$4,611,301}{\$6,947,744.39} = 0.6637$$

BCR < 1, so reject

Q12.) While reviewing the accounting records of a local print shop, you notice that their oldest printer has a book value of $8,640. The printer cost $30,000 to purchase, and is depreciated using a **5-year MACRS**. Using MACRS table provided below, determine how many years the printer has been in service.

Year	Book Value	Depreciation
0	30000	
1	30000-6000=24000	30000*0.2=6000
2	24000-9600=14400	30000*0.32=9600
3	14400-5760=8640	30000*0.192=5760

Q17.) You want to start a food truck business. It requires an initial investment of $2,980, and annual maintenance costs of $1,289. You estimate to make revenues of $6,747 annually. You calculate the PW of your base case using the equation provided below. Using Sensitivity Analysis, calculate the **PW** for a **25% increase** in initial investment cost.

PW_base = -$2,980 + ($6,747 -$1,289)*(P/A, 20%, 7) =

-2,980+5458*(P/A, 20%, 7)=-2,980+5458*(3.605)=22656.09

PW_inc=-2,980*(1+0.25)+5458*(3.605)=15951.09