

**E355 Engineering Economics Spring 2022**  
**Classroom Assignment #4**

**“I pledge my honor that I have abided by the Stevens Honor System”**

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**1. A small town called Dua Lupa wants to raise money and is considering buying an amusement rocket ride to let visitors levitate. The levitating ride will cost \$175,000 to purchase. Each year, costs associated with the amusement ride are estimated to be \$7,500. The income from the levitation ride is expected to be \$50,000 the first year and increase by \$3,500 each year for the 10 year life of the amusement ride. Determine the B/C ratio if the interest rate is 4%. [3 points]**

$$\frac{B}{C} \text{ ratio} = \frac{\text{Worth of benefits}}{\text{Worth of costs}}$$

**Benefits:**

First year income: \$50,000  
+\$3,500 every year

**Costs:**

Initial cost: \$175,000  
Yearly cost: \$7,500

$$AW_{\text{benefits}} = G(A/G, i, n) + A_{\text{year 1}} = 3500(A/G, 4\%, 10) + 50000 = \$64,619.50$$

$$AW_{\text{costs}} = P(A/P, i, n) + A = 175000(A/P, 4\%, 10) + 7500 = \$29,077.50$$

$$\frac{B}{C} = \frac{AW_{\text{benefits}}}{AW_{\text{costs}}} = \frac{\$64,619.50}{\$29,077.50} = 2.22$$

**2. A company will buy a new machine for \$18,000. The salvage value is \$1,200 at the end of its life. Using the following MACRS rates, determine the depreciation schedule and complete the table below. [3 points]**

$$\text{Depreciation value} = \$18,000 - \$1,200 = \$16,800$$

Year	MACRS Rate	Calculation	Depreciation	Summed Dep	Book Value
1	0.28	16800•0.28	\$4,704	\$4,704	\$13,296
2	0.48	16800•0.48	\$8,064	\$12,768	\$5,232
3	0.19	16800•0.19	\$3,192	\$15,960	\$2,040
4	0.05	16800•0.05	\$840	\$16,800	\$1,200