

S-8.1 A corporation is considering spending \$3 million for a new stamping machine that will save \$550,000 per year (repairs, down time, etc.) over its seven-year life. At the end of its life, the machine could be sold for \$1.8 million. An alternative is to spend \$1 million on an overhaul of the existing machine. This would extend its life seven more years and save \$175,000 per year. The value of the overhauled machine would be \$750,000 at the end of its extended lifespan. Calculate the benefit-cost ratio for each alternative. Identify the best choice. The corporation MARR is 12% per year.

S-8.2 An environmentally friendly 2,800-square-foot green home (99% air tight) costs about 8% more to construct than a same-sized conventional home. Most green homes can save 15% per year on energy expenses to heat and cool the living space. For a \$250,000 conventional home with a heating and cooling bill of \$3,000 per year, how much would have to be saved in energy expenses per year to justify this home (i.e., B–C ratio greater than or equal to one)? The discount rate is 10% per year, and the expected life of the home is 30 years.

S-8-3 The New York Cab Company is considering replacing a car in its fleet of taxi cabs. The car has been operational for one year. It has a maximum life span of four years. It can be replaced by an identical car now (end of year 1), one, two, or three years from now (end of years 2, 3 or 4). The cab company’s MARR is 7% per year. The market value (MV) and annual operating costs (AOC) for the car are as follows.

Should the car be replaced now? If not now, when?

Year	MV (\$)	AOC (\$)
0	20,000	--
1	14,000	-7,000
2	10,000	-9,000
3	5,000	-14,000
4	0	-19,000