Exercise 2.4

4. Three mutually exclusive projects are being considered for a remote river valley: Project R, a recreational facility, has estimated benefits of $20 million and costs of $16 million; project F, a forest preserve with some recreational facilities, has estimated benefits of $26 million and costs of $20 million; project W, a wilderness area with restricted public access, has estimated benefits of $10 million and costs of $2 million. In addition, a road could be built for a cost of $8 million that would increase the benefits of project R by $16 million, increase the benefits of project F by $10 million, and reduce the benefits of project W by $2 million. Even in the absence of any of the other projects, the road has estimated benefits of $4 million.

    a. **Calculate the benefit-cost ratio and net benefits for each possible alternative to the status quo. Note that there are seven possible alternatives to the status quo: R, F, and W, both with and without the road, and the road alone.**

    b. **If only one of the seven alternatives can be selected, which should be selected according to the CBA decision rule?**

4.a. The seven possible alternatives to the status quo have the following costs (millions), benefits (millions), benefit/cost ratios, and net benefits (millions):

Alternative	B ($)	C ($)	B/C Ratio	NB ($)
Project R without road	20	16	1.25	4
Project R with road	36	24	1.50	12
Project F without road	26	20	1.30	6
Project F with road	36	28	1.28	8
Project W without road	10	2	5.00	8
Project W with road	8	10	0.80	-2
Road alone	4	8	0.50	-4

4.b. Even though Project W without the road has the largest benefit/cost ratio, Project R with the road offers the largest net benefits among the possible projects and therefore would be selected by the CBA decision rule.