#3, #12, #16~#17, #19, #23, and #25

3. Calculating Discounted Payback An investment project has annual cash inflows of $5,000, $5,500, $6,000, and $7,000, and a discount rate of 14 percent. What is the discounted payback period for these cash flows if the initial cost is $8,000? What if the initial cost is $12,000? What if it is $16,000?

12. Problems with Profitability Index The Robb Computer Corporation is trying to choose between the following two mutually exclusive design projects:

Year	Cash Flow (I)	Cash Flow (II)
0	−$30,000	−$12,000
1	18,000	7,500
2	18,000	7,500
3	18,000	7,500

a. If the required return is 10 percent and Robb Computer applies the profitability index decision rule, which project should the firm accept?
b. If the company applies the NPV decision rule, which project should it take?
c. Explain why your answers in (a) and (b) are different.

16. Comparing Investment Criteria Consider the following cash flows of two mutually exclusive projects for AZ-Motorcars. Assume the discount rate for AZ-Motorcars is 10 percent.

Year	AZM Mini-SUV	AZF Full-SUV
0	−$450,000	−$800,000
1	320,000	350,000
2	180,000	420,000
3	150,000	290,000

a. Based on the payback period, which project should be accepted?
b. Based on the NPV, which project should be accepted?
c. Based on the IRR, which project should be accepted?
d. Based on this analysis, is incremental IRR analysis necessary? If yes, please conduct the analysis.

17. Comparing Investment Criteria The treasurer of Amaro Canned Fruits, Inc., has projected the cash flows of projects *A*, *B*, and *C* as follows:

Year	Project *A*	Project *B*	Project *C*
0	−$150,000	−$300,000	−$150,000
1	110,000	200,000	120,000
2	110,000	200,000	90,000

Suppose the relevant discount rate is 12 percent a year.

a. Compute the profitability index for each of the three projects.
b. Compute the NPV for each of the three projects.
c. Suppose these three projects are independent. Which project(s) should Amaro accept based on the profitability index rule?
d. Suppose these three projects are mutually exclusive. Which project(s) should Amaro accept based on the profitability index rule?
e. Suppose Amaro's budget for these projects is $450,000. The projects are not divisible. Which project(s) should Amaro accept?

19. Comparing Investment Criteria Consider two mutually exclusive new product launch projects that Nagano Golf is considering. Assume the discount rate for Nagano Golf is 15 percent.

Project *A:* Nagano NP-30.
Professional clubs that will take an initial investment of $550,000 at time 0.
Next five years (Years 1–5) of sales will generate a consistent cash flow of $185,000 per year.
Introduction of new product at Year 6 will terminate further cash flows from this project.

Project *B:* Nagano NX-20.
High-end amateur clubs that will take an initial investment of $350,000 at Time 0.
Cash flow at Year 1 is $100,000. In each subsequent year cash flow will grow at 10 percent per year.
Introduction of new product at Year 6 will terminate further cash flows from this project.

Year	NP-30	NX-20
0	−$550,000	−$350,000
1	185,000	100,000
2	185,000	110,000
3	185,000	121,000
4	185,000	133,100
5	185,000	146,410

Please fill in the following table:

	NP-30	NX-20	Implications
Payback			
IRR			
PI			
NPV			

23. NPV Valuation The Yurdone Corporation wants to set up a private cemetery business. According to the CFO, Barry M. Deep, business is "looking up." As a result, the cemetery project will provide a net cash inflow of $290,000 for the firm during the first year, and the cash flows are projected to grow at a rate of 5 percent per year forever. The project requires an initial investment of $3,900,000.

a. If Yurdone requires a return of 11 percent on such undertakings, should the cemetery business be started?

b. The company is somewhat unsure about the assumption of a growth rate of 5 percent in its cash flows. At what constant growth rate would the company just break even if it still required a return of 11 percent on investment?

25. NPV and IRR Butler International Limited is evaluating a project in Erewhon. The project will create the following cash flows:

Year	Cash Flow
0	−$950,000
1	285,000
2	345,000
3	415,000
4	255,000

All cash flows will occur in Erewhon and are expressed in dollars. In an attempt to improve its economy, the Erewhonian government has declared that all cash flows created by a foreign company are "blocked" and must be reinvested with the government for one year. The reinvestment rate for these funds is 4 percent. If Butler uses a required return of 11 percent on this project, what are the NPV and IRR of the project? Is the IRR you calculated the MIRR of the project? Why or why not?