

**Problem 8-14**

**Goal:** Determine annual cash flow, discounted cash flow, and net present worth

**Given:**

Fixed Capital Investment	\$1,000,000	
Working Capital Investment	\$100,000	
Annual Sales	\$500,000	
Annual Expenditures	\$100,000	
Project Life	5	years (Assuming straight-line depreciation)
Income Tax Rate	35%	
Discount rate	10%	

**Approach:**

use Table 8-3 definitions:  
 All expenses = cash expenses + **Depreciation**  
 Straight-line depreciation of Fixed Capital = Fixed Capital / life  
 Fixed Capital Investment = Total Capital - Working Capital  
 Assume: identical constant depreciation amount for BOTH tax calculation and capital recovery  
 Cash Flow = (Sales - Costs - Depreciation) \* (1 - tax rate) + Depreciation  
 Present Worth continuous interest factor =  $[(e^r - 1) / r] * e^{-rj}$   
 b) Assume 5% inflation rate for both sales and expenditures 5%

**Calculations:**

Continuous Present Worth Factor 1.05171  
 Depreciation \$200,000 = \$1,000,000 / 5

Year	Revenue	Product Cost	Depreciation	Cash Flow	PW Factor	Present Worth
1	\$500,000	\$100,000	\$200,000	\$330,000	0.95163	\$314,036.52
2	\$500,000	\$100,000	\$200,000	\$330,000	0.86107	\$284,151.99
3	\$500,000	\$100,000	\$200,000	\$330,000	0.77913	\$257,111.36
4	\$500,000	\$100,000	\$200,000	\$330,000	0.70498	\$232,643.98
5	\$500,000	\$100,000	\$200,000	\$330,000	0.63789	\$210,504.97

**Answer a)**

**Net Present Worth** \$250,960 discrete compound interest **\$298,449** continuous interest

Year	Revenue	Product Cost	Depreciation	Cash Flow	PW Factor	Present Worth
1	\$500,000	\$100,000	\$200,000	\$330,000	0.95163	\$314,036.52
2	\$525,000	\$105,000	\$200,000	\$343,000	0.86107	\$295,345.86
3	\$551,250	\$110,250	\$200,000	\$356,650	0.77913	\$277,875.05
4	\$578,813	\$115,763	\$200,000	\$370,983	0.70498	\$261,535.89
5	\$607,753	\$121,551	\$200,000	\$386,032	0.63789	\$246,247.20

**Answer b)**

**Net Present Worth** \$344,509 discrete compound interest **\$395,041** continuous interest