Owen Eyewear is planning to purchase a $520,000 computer system to improve the quality and lead time of its eyewear production. Management estimates that this investment will result in increased annual cash revenues of $280,000 with related operating costs of $57,000. The computer system will be depreciated by the Modified Accelerated Cost Recovery System (MACRS) over a five-year life with no salvage value; however, Owen expects to sell the computer system at the end of Year 5 for $33,000. Determine the net present value (NPV) of this investment opportunity.

Assume a 30% income tax rate and a 12% hurdle rate. Also assume that the asset will be placed in service at the beginning of the fiscal year.

MACRS Rates: Year 1, 20.0%; Year 2, 32.0%; Year 3, 19.2%; Year 4, 11.52%; Year 5, 11.52%; Year 6, 5.76%

Correct

- (●) $149,408
- ( ) $165,045

Calculator | Time Value Tables

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	Year 1	Year 2	Year 3	Year 4	Year 5
Before-tax cash flow	$ 223,000	$223,000	$ 223,000	$ 223,000	$ 223,000
Depreciation:					
Purchase price ×					
MACRS depr. rate	104,000	166,400	99,840	59,904	29,952**
Taxable income	119,000	56,600	123,160	163,096	193,048
Income tax (30%)	35,700	16,980	36,948	48,929	57,914
After-tax income	83,300	39,620	86,212	114,167	135,134
Depreciation	104,000	166,400	99,840	59,904	29,952**
After-tax cash flow	$187,300	$206,020	$186,052	$174,071	$165,086
Present value	$167,232*	$164,238	$132,428	$110,625	$ 93,674

* To calculate the PV of the after-tax cash flow:

Calculator steps: Clear All

Enter 1 in the N key

Calculator | Time Value Tables

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Calculate all the subsequent years in the same manner. Be sure to enter the correct year in N.

**Because the asset was sold before Year 6, under the MACRS half-year convention rule, only half of the depreciation is taken in the year case, it is $29,952.

Sum of Present Value of After-Tax Cash Flows = $668,197.

Initial Purchase Price = ($520,000).

Gain on Sale = Sales Price − Book Value = $33,000 − $29,952 = $3,048.

After-Tax Gain on Sale = $3,048 × (1 − 30%) = $2,133.60.

Calculator steps: Clear All

Enter 5 in the N key

Enter 12 in the I/YR key

Calculator | Time Value Tables

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ABS Corporation is considering an investment in new machinery and is gathering data about the proposed purchase. The new machine costs $500,000 and will have delivery charges of $45,000 and installation charges of $25,000. The new machine will be depreciated over 5 years with a salvage value of $0. The old machinery had an original cost of $200,000. The current book value of the old machinery is $15,000 and has a current market value of $25,000. The new machine is expected to produce marginal cash revenues of $325,000 and marginal cash expenses of $75,000 annually for each of the next 5 years. The new machine will be sold at the end of the 5-year project for its projected salvage value of $30,000, when it will be fully depreciated. ABS is subject to a 25% tax rate. ABS Corporation has a weighted average cost of capital of 12%, but since this project is riskier than other projects, management has decided to adjust the required rate of return by 2%. Below is a table of present value factors.

	Present Value of $1			**Present Value of a $1 Annuity**		
	10%	12%	14%	10%	12%	14%
1	0.9091	0.8929	0.8772	0.9091	0.8929	0.8772
2	0.8264	0.7972	0.7695	1.7355	1.6901	1.6467
3	0.7513	0.7118	0.6750	2.4869	2.4018	2.3216
4	0.6830	0.6355	0.5921	3.1699	3.0373	2.9137
5	0.6209	0.5674	0.5194	3.7908	3.6048	3.4331

Calculate the net present value of the project.

- ($200,636.95)

Calculator | Time Value Tables

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- $270,280.67

Correct

- $190,731.28

Your Answer

- $179,045.49

This Answer is Correct

Correct. The installed cost of the new asset equals $500,000 + $45,000 + $25,000 = $570,000. The after-tax proceeds from the sale of the old asset are ($25,000 − $15,000) × (1 − 25%) = $7,500. The initial investment is $570,000 − $7,500 = $562,500. The depreciation equals $570,000 ÷ 5 years = $114,000 per year. The annual pre-tax income is $325,000 − $75,000 − $114,000 = $136,000. After-tax income equals $136,000 × (1 − 25%) = $102,000. Incremental operating cash flows are $102,000 + $114,000 = $216,000. Terminal cash flows are $30,000 × (1 − 25%) = $22,500. Using a discount rate of 14% (to adjust for risk), NPV = $216,000 × 3.4331 + $22,500 × 0.5194 − $562,500 = $190,731.28.

Calculator | Time Value Tables

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VCI Corporation is considering an investment in new machinery and is gathering data about the proposed purchase. The new machine costs $250,000 and will have delivery charges of $15,000 and installation charges of $25,000. The new machine will be depreciated over 5 years with a salvage value of $10,000. The old machinery had an original cost of $100,000. The current book value of the old machinery is $10,000 and it has a current market value of $7,500. The new machine is expected to produce marginal cash revenues of $150,000 and marginal cash expenses of $30,000 annually for each of the next 5 years. VCI is subject to a 25% tax rate. Calculate VCI Corporation's initial investment.

Your Answer

- (selected) $281,875
- $290,000
- $250,000
- $282,500

You Answered Correctly!

Calculator | Time Value Tables

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- $290,000
- $250,000
- $282,500

You Answered Correctly!

Correct. The initial investment is the installed cost of the new machine minus the after-tax proceeds from the sale of the old machine. The installed cost of the new machine equals $250,000 + $15,000 + $25,000 = $290,000. The loss on the sale of the old machine equals $7,500 − $10,000 = ($2,500). The tax savings is $2,500 × 25% = $625. The after-tax proceeds from the sale of the old machine equals the market value plus the tax savings ($7,500 + 625 = $8,125). The initial investment equals $290,000 − $8,125 = $281,875.

Calculator | Time Value Tables

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$1,141,200.

Correct

$760,800.

Your Answer

$1,902,000.

This Answer is Correct

The amount related to the new asset's depreciation that would be included in an NPV analysis would be equal to the present value (PV) of the depreciation tax shield.

PV = (tax rate)(annual depreciation)(PV of annuity factor, i=10, n=4)

Annual depreciation = $2,400,000 ÷ 4 years = $600,000

PV = (0.4)($600,000)(3.17) = $760,800.

Calculator

Time Value Tables

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Question 100 of 250 (2E2-LS11)

Custom Assessment

Time Spent: 18:00:0

A company wants to evaluate the purchase of a new machine.

- The machine costs $48,000 plus $2,000 in shipping and installation charges.
- Purchase of the machine would require an increase in net working capital of $5,000.
- The company depreciates this asset according to a Modified Acceleration Cost Recovery System (MACRS) depreciation schedule for a five-year asset (Year 1 = 0.20, Year 2 = 0.32, Year 3 = 0.19, Year 4 = 0.12, Year 5 = 0.11, and Year 6 = 0.06).
- The company expects that the computer would increase its before-tax revenues by $30,000 a year, but would also increase operating costs by $10,000 a year.
- The company expects to sell the machine after five years for $8,000.
- The firm's marginal tax rate is 40%.

What is the initiation cash flow in Year 0 for the capital budgeting project?

- ($48,000).
- ($50,000).

Your Answer

- ($55,000).

Calculator | Time Value Tables

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Topeka Products uses the net present value (NPV) method to evaluate capital projects. Topeka plans to acquire a depreciable asset on January 1 of next year for $2.4 million.

- The new asset has an estimated service life of four years, a zero terminal disposal value, and will be depreciated on a straight-line basis.
- The new asset will replace an existing asset that is expected to be sold for $350,000.
- The tax basis of the existing asset is $330,000.
- Topeka is subject to an effective income tax rate of 40% and assumes that any gains or losses affect the taxes paid at the end of the year in which the gains or losses occur.
- Topeka uses a 10% discount rate for NPV analyses.

The present value of the new asset's depreciation tax-shield that would be included in an NPV analysis is:

- ○ $960,000.
- ○ $1,141,200.
- Correct
- ◉ $760,800.

Calculator | Time Value Tables

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