P13-119

(Ignore income taxes in this problem.) Tranter, Inc., is considering a project that would have a ten-year life and would require a $1,200,000 investment in equipment. At the end of ten years, the project would terminate and the equipment would have no salvage value. The project would provide net operating income each year as follows:

Sales		$1,700,000
Variable expenses		1,200,000
Contribution margin		500,000
Fixed expenses:		
Fixed out-of-pocket cash expenses	$200,000	
Depreciation	120,000	320,000
Net operating income		$ 180,000

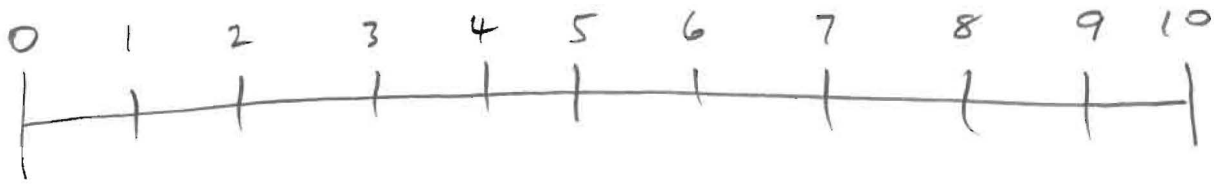
180,000 ÷ 1,200,000 = 15% = SRR

All of the above items, except for depreciation, represent cash flows. The company's required rate of return is 12%.

Required:

a. Compute the project's net present value. $495,000
b. Compute the project's internal rate of return to the nearest whole percent. 21%
c. Compute the project's payback period. 1,200,000 ÷ 300,000 = 4 yrs.
d. Compute the project's simple rate of return. 15%

i = 12%
n = 10 yrs.
(000).



0 SV.

(1,200)

300 300 300 300 300 300 300 300 300 300

1,695 ← x 5.650 n=10 i=12%

$495 = NPV

IRR = 1,200,000 / 300,000 = 4.0 n=10

IRR = 21%

P13-119

a. Because depreciation is the only noncash item on the income statement, the annual net cash flow can be computed by adding back depreciation to net operating income.

Net operating income.....	$180,000
Depreciation.....	120,000
Annual net cash flow	$300,000

	Year(s)	Amount of Cash Flow	12% Factor	Present Value of Cash Flows
Initial investment.....	Now	$(1,200,000)	1.000	$(1,200,000)
Annual net cash flows.....	1-10	$300,000	5.650	1,695,000
Net present value.....				$ 495,000

b. The formula for computing the factor of the internal rate of return (IRR) is:
Factor of the IRR = Investment required ÷ Annual net cash inflow
$1,200,000 ÷ $300,000 = 4.00 Factor
To the nearest whole percent, the internal rate of return is 21%

c. The formula for the payback period is:
Payback period = Investment required ÷ Annual net cash inflow
$1,200,000 ÷ $300,000 per year = 4.0 years

d. The formula for the simple rate of return is:
Simple rate of return = Annual incremental net operating income ÷ Initial investment
$180,000 ÷ $1,200,000 = 15%

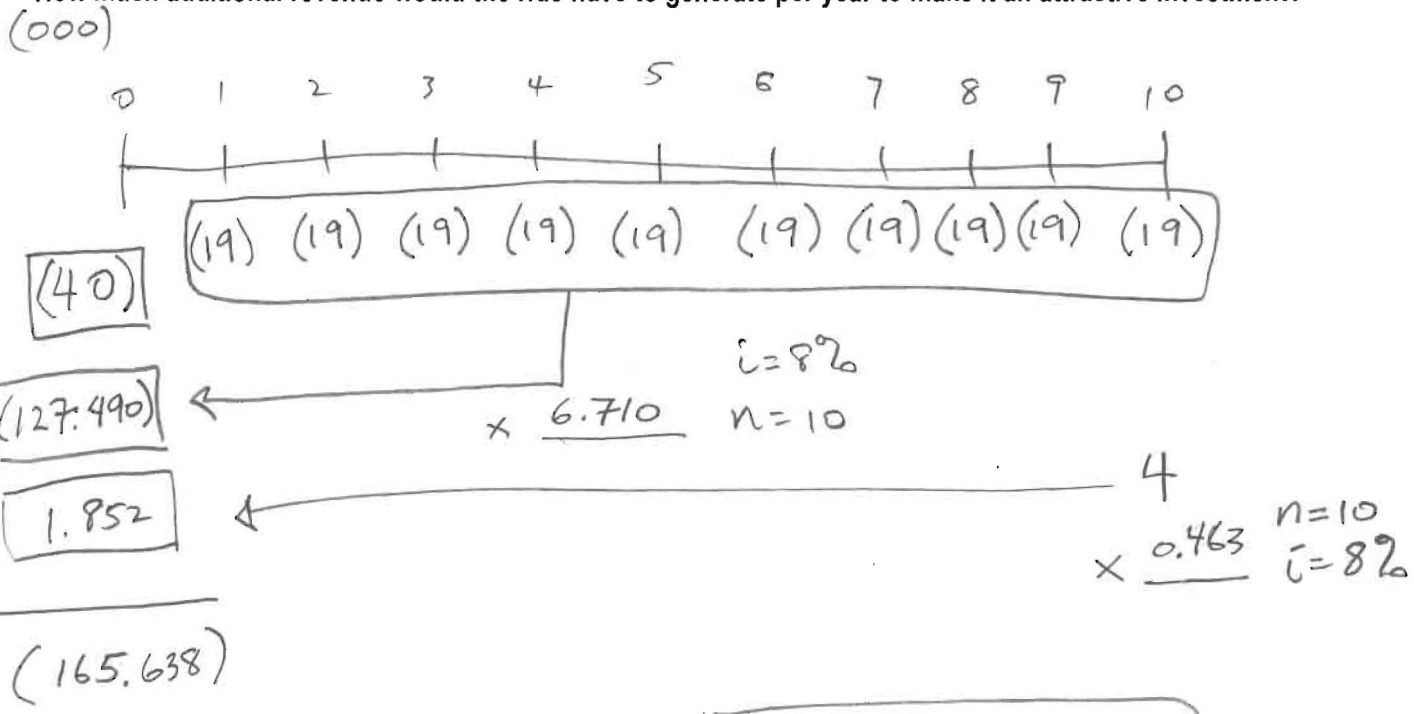
AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 13-01 Evaluate the acceptability of an investment project using the net present value method
Learning Objective: 13-02 Evaluate the acceptability of an investment project using the internal rate of return method
Learning Objective: 13-05 Determine the payback period for an investment
Learning Objective: 13-06 Compute the simple rate of return for an investment
Level: Medium

P 13-136

(Ignore income taxes in this problem.) The management of an amusement park is considering purchasing a new ride for $40,000 that would have a useful life of 10 years and a salvage value of $4,000. The ride would require annual operating costs of $19,000 throughout its useful life. The company's discount rate is 8%. Management is unsure about how much additional ticket revenue the new ride would generate-particularly because customers pay a flat fee when they enter the park that entitles them to unlimited rides. Hopefully, the presence of the ride would attract new customers.

Required:

How much additional revenue would the ride have to generate per year to make it an attractive investment?



$\frac{165,638}{6.710} =$ $24,685 additional annual revenue

P 13-136

Item	Year(s)	Amount of Cash Flow	8% Factor	Present Value of Cash Flows
Initial investment	Now	$(40,000)	1.000	$ (40,000)
Annual operating costs	1-10	$(19,000)	6.710	(127,490)
Salvage value	10	$4,000	0.463	1,852
Net present value				$(165,638)

Minimum annual cash flows required = Negative net present value to be offset ÷ Present value factor

$165,638 ÷ 6.710 = $24,685

This much additional revenue would result in a zero net present value. Any less than this and the net present value would be negative. Any more than this and the net present value would be positive.

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 13-03 Evaluate an investment project that has uncertain cash flows
Level: Hard

P13-138

(Ignore income taxes in this problem.) Ahlman Corporation is considering the following three investment projects:

	Project A	Project B	Project C
Investment required.....	$33,000	$47,000	$77,000
Present value of cash inflows	$39,270	$48,410	$89,320
NPV	$6,270	$1,410	$12,320
Inv. Req'd	÷ 33,000	÷ 47,000	÷ 77,000
Profit Index	0.19	0.03	0.16

Required:

Rank the investment projects using the project profitability index. Show your work

Rank	(1)	(3)	(2)

P13-138

(Ignore income taxes in this problem.) Ahlman Corporation is considering the following three investment projects:

	Project A	Project B	Project C
Investment required	$33,000	$47,000	$77,000
Present value of cash inflows	$39,270	$48,410	$89,320

Required:

Rank the investment projects using the project profitability index. Show your work

	Project A	Project B	Project C
Investment required (a)	$(33,000)	$(47,000)	$(77,000)
Present value of cash inflows	39,270	48,410	89,320
Net present value (b)	$6,270	$1,410	$12,320
Project profitability index (b) ÷ (a)	0.19	0.03	0.16
Ranked by project profitability index	1	3	2

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 13-04 Rank investment projects in order of preference
Level: Easy

(Cost − SV)
(537,600 − 107,520) / 9 EUL = 47,787 per yr depreciation

P13-140

(Ignore income taxes in this problem.) Brewer Company is considering purchasing a machine that would cost $537,600 and have a useful life of 9 years. The machine would reduce cash operating costs by $82,708 per year. The machine would have a salvage value of $107,520 at the end of the project.

Required:

a. Compute the payback period for the machine.
b. Compute the simple rate of return for the machine.

$537,600 ÷ 82,708 = 6.5 yrs.

	Annual
cost savings	$82,708
− depree expense	47,787
annual NI	34,921

$$\frac{\text{Annual NI}}{\text{Initial Investment}} = \frac{34,921}{537,600} = 6.50\% \text{ SRR}$$

P13-140

(Ignore income taxes in this problem.) Brewer Company is considering purchasing a machine that would cost $537,600 and have a useful life of 9 years. The machine would reduce cash operating costs by $82,708 per year. The machine would have a salvage value of $107,520 at the end of the project.

Required:

a. Compute the payback period for the machine.
b. Compute the simple rate of return for the machine.

a. The payback period is computed as follows:
Payback period = Investment required ÷ Annual net cash flow
= $537,600 ÷ $82,708 = 6.50 years
In this case the salvage value plays no part in the payback period because all of the investment is recovered before the end of the project.
b. The simple rate of return is computed as follows:

Annual incremental cost savings.....		$82,708
Annual incremental expenses:		
Annual depreciation ($537,600 – $107,520)/9	$47,787	47,787
Annual incremental net operating income.....		$34,921

Simple rate of return = Annual incremental net operating income ÷ Initial investment
= $34,921 ÷ $537,600 = 6.50%

AACSB: Analytic
AICPA BB: Critical Thinking
AICPA FN: Measurement
Bloom's: Application
Learning Objective: 13-05 Determine the payback period for an investment
Learning Objective: 13-06 Compute the simple rate of return for an investment
Level: Medium