BEE/CSS 371 Business of Technology
Winter 2017
Review for the final exam

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What is the most important part of a business plan if you’re seeking funding?

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The executive summary at the very beginning. A lot of potential investors may never read past the first paragraph.

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A sole proprietor.

What is a going concern and why is that an important assumption in accounting?

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A going concern is one that is expected to remain in operation. This means there's no need to consider liquidation values.

What is the matching principal in accounting?

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Net income is best measured by matching costs against revenues.

Assets must equal what?

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Liabilities (or alternately, liabilities + owners' equity.)

What does it mean to say that some assets are more liquid than others?

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They can be more easily turned into cash.

What is the difference between an expense and a cost?

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Costs are amounts spent to create inventory. Expenses are for R&D, marketing and administrative needs of the business.

If you buy a new car from a dealer, then immediately try to sell it, you'll get less than you paid. That loss on what you paid versus what you could get for it is called what?

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It's a transaction cost. To do the deal, the dealer had to get paid and that leaked off from your overall financial position. But it's not depreciation as an accountant would use the term and not even something an account would record unless you actually sold the vehicle and took the loss.

What is a current asset? Is there another kind?

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An asset that is could be turned into cash within a year, including cash and equivalents, accounts receivable and inventories.   The other kind would be long-term assets, including fixed assets like property, plant and equipment, and intangibles, e.g., patents and goodwill, and certain kinds of investments.

What is a non-cash expense? Can you give an example?

What is a non-cash expense? Can you give an example?

It’s an expense that’s deducted from revenue when calculating net income but which didn’t require an outlay of cash. Examples include depreciation and stock grants to employees in lieu of cash compensation.

The right side of a balance sheet is broken down into what?

The right side of a balance sheet is broken down into what?

Liabilities and owners’ equity.

What is depreciation? What is book value?

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Depreciation is a way of spreading the cost of a long term asset like a building or a machine over its useful lifetime and to allow for eventual replacement. For example, a machine costing $10,000 with an expected lifetime of 10 years would result in a non-cash expense of $1,000 per year under straight-line (same every year) depreciation. This non-cash expense gets subtracted from revenue when calculating net income and from the remaining value of the asset, called the book value.

What is an example of something that does not depreciate?

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Land does not depreciate. It’s assumed it will outlast us all. And, of course, neither does cash.

The following alphabetical list was obtained from the accounting department at Vortex, Inc. as of Dec 31, 2014. Prepare a proper balance sheet and determine the proper amount to be shown as equipment.

Accounts payable	$15,000	Inventories	$8,000
Accounts receivable	6,000	Land	20,000
Accrued mortgage interest	1,500	Mortgage debt	38,000
Buildings	74,000	Patents	8,200
Capital stock	50,000	Prepaid insurance	1,100
Cash	6,300	Temporary investments	600
Equipment	?	Retained earnings	19,000
Estimated taxes owed	10,300	Wages payable	2,000

Assets

Current assets		
Cash	6300	
Accounts receivable	6000	
Inventories	8000	
Prepaid insurance	1100	
Temporary investments	600	22000
Long-term assets		
Buildings	74000	
Equipment	**11600**	
Land	20000	
Patents	8200	113800
Total assets		135800

Liabilities

Current liabilities		
Accounts payable	15000	
Accrued mortgage interest	1500	
Estimated taxes owed	10300	
Wages payable	2000	28800
Long term liabilities		
Mortgage debt	38000	38000
Total liabilities		66800
Stockholder's equity		
Capital stock	50000	
Retained earnings	19000	69000
Total liabilities and equity		135800

What is goodwill?

What is goodwill?

It’s comprised of the unidentified intangible assets, usually the purchase price minus book or market values of tangible specific assets.

What is leverage?

What is leverage?

It’s controlling a larger asset by borrowing part of the value, e.g., buying a home with a mortgage or buying stock on margin. It’s called leverage because it multiplies the effects of any changes in value of the asset.

Ratios are often used to measure liquidity, margins and profitability. Can you give an example of each and tell how it’s calculated?

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Liquidity

$$Current\ ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Quick\ Ratio = \frac{Cash + Cash\ Equivalents + Marketable\ Securities + Accounts\ Receivable}{Current\ Liabilities}$$

$$Cash\ Ratio = \frac{Cash}{Current\ Liabilities}$$

Margins

$$Gross\ margin = \frac{Revenue\ - COGS}{Revenue}$$

$$Operating\ margin = \frac{Revenue\ - COGS}{Revenue}$$

$$Pretax\ margin = \frac{Net\ income}{Revenue}$$

Profitability

$$Pretax\ ROE = \frac{Earnings\ before\ tax}{Shareholder's\ equity}$$

$$Aftertax\ ROE = \frac{Net\ income}{Shareholder's\ equity}$$

$$ROI = \frac{Net\ income}{Total\ assets}$$

What is a P&L and what is the more common name for this type of statement?

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Profit and loss = Income statement.

What is breakeven?

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Breakeven is the sales volume at which revenue = fixed + variable costs and profit = 0.

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Because they're probably not planning on liquidating it in the next 12 months, it would likely be listed as a long-term asset.

Long term assets

10 one ounce gold coins	$4,250

Acme owns 10 acres of land with a warehouse. The land was bought raw for $100,000 in 2000. The warehouse was constructed at a cost of $1M in 2004 and is expected to have a useful life of 50 years. Acme is using straight line depreciation, deducting the same depreciation expense every year. What is the yearly depreciation expense?

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The yearly depreciation is $1M / 50 years = $20,000, which would appear as an expense on Acme's income statement. The land and the building would be listed as long-term assets on Acme's balance sheet. Land does not depreciate, so it will be listed at its original sales price of $100,000. After 10 years of depreciation, the building will have a book value of $1M – 10 * $20,000 = $800,000.

What’s the difference between simple and compound interest?

What’s the difference between simple and compound interest?

Simple interest is computed as the number of periods x the interest rate. Compound interest is computed by adding the interest earned during each period to the principal so that the interest begins to earn interest.

What is APR?

What is APR?

APR = Annual percentage rate, a term introduced by the *Truth in Lending Act* of 1968. APRs are stated as a yearly rate but are invariably compounded monthly.

What is an annuity? Draw an example cash flow diagram.

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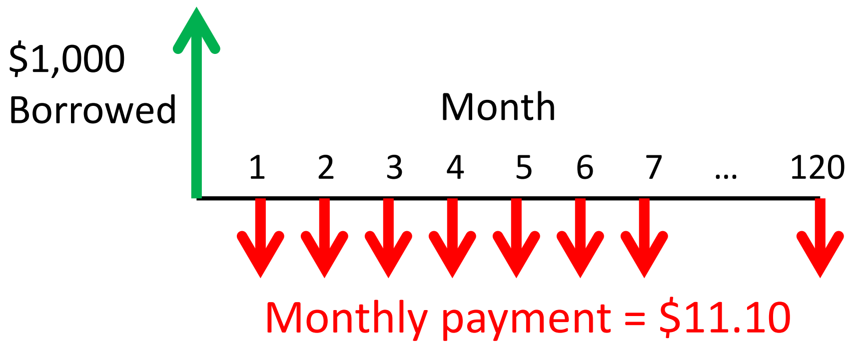
An annuity is a series of equal payments at the end of each period.

Here is an example cash flow diagram representing \$1000 borrowed for 10 years at 6% APR paid back as an annuity consisting of 120 equal monthly payments.



What is a sinking fund? Draw an example cash flow diagram.

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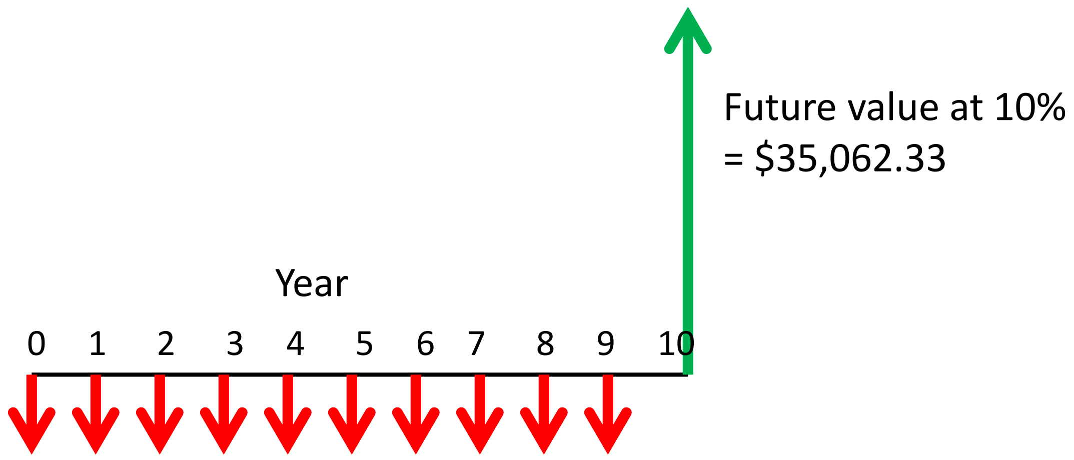
A sinking fund is an annuity you pay into to get a future return. Payments are at the beginning of the period, not the end. Here is an example cash flow diagram representing $2000/year paid in for 10 years at 10% for a future value of $35,062.33.



What does it mean to amortize a loan?

What does it mean to amortize a loan?

It’s a term used in lending that means each payment will be allocated to separate principal and interest amounts, rounded to the nearest penny. It’s most commonly used in mortgage loans and typically presented as a table called an amortization schedule.

What do IRR and NPV refer to and how are they related?

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NPV is the net present value = the net sum of all the discounted payments at some given discount rate. IRR is the internal rate of return = the discount rate at which the NPV is zero.

You financed your home almost 3 years ago with a mortgage of $300K for 20 years at 5% APR. What is your mortgage payment for principal and interest?

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$$Monthly\ payment = \frac{A}{P}\left(i = \frac{0.05}{12} = 0.004167, n = 12 * 20\right) * \$300K$$
$$= \$1{,}979.87$$

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Year	Beginning principal	Interest paid	Principal paid	Ending principal
1	300,000.00	14,796.47	8,961.97	291,038.03
2	291,038.03	14,337.96	9,420.48	281,617.55
3	281,617.55	13,855.99	9,902.45	271,715.10

You’ve borrowed $1000 to be paid back as a lump sum in 10 years at an APR of 8%, compounded monthly. What is the future value you will have to pay back? What’s the equivalent simple interest rate?

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$$Future\ value = \frac{F}{P}\left(i = \frac{0.08}{12} = 0.006667, n = 120\right) * 1000 = \$2{,}219.64$$

$$Equivalent\ simple\ interest\ rate = \frac{2219.64 - 1000}{1000\ * 10} = 0.122 = 12.2\%$$

Your bank just sent you a nastygram claiming that you’ve been late more often than they like and they’re slamming you with a “Penalty APR of 29.99%”. What’s the effective interest rate?

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$$Effective\ rate = \ (1 + Nominal\ rate\ per\ period\ )^{Periods\ per\ year} - 1$$

$$Effective\ rate = \ (1 + \frac{0.2999}{12})^{12} - 1 = 0.345 = 34.5\%$$

If you owe $1000 now, what will you owe a year from now at 29.99% APR if you make no payments?

If you owe $1000 now, what will you owe a year from now at 29.99% APR if you make no payments?

$$Future\ value = \frac{F}{P}\left(i = \frac{0.2999}{12} = 0.024992, n = 12\right) * 1000 = \$1{,}344.76$$

If you can balance transfer it to another card offering a 9.99% rate with a 5% transfer fee (added to your balance), what would your monthly payment be to pay it off in one year?

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$$Monthly\ payment = \frac{A}{P}\left(i = \frac{0.0999}{12} = 0.008325, n = 12\right) * 1000 * 1.05 = \$92.31$$

You’ve considering building a new strip mall. You expect to invest \$1.5M, spend \$50K/year on various expenses, collect \$200K/year in rent and hope to sell in 5 years at \$3M. Draw the cash flow diagram.

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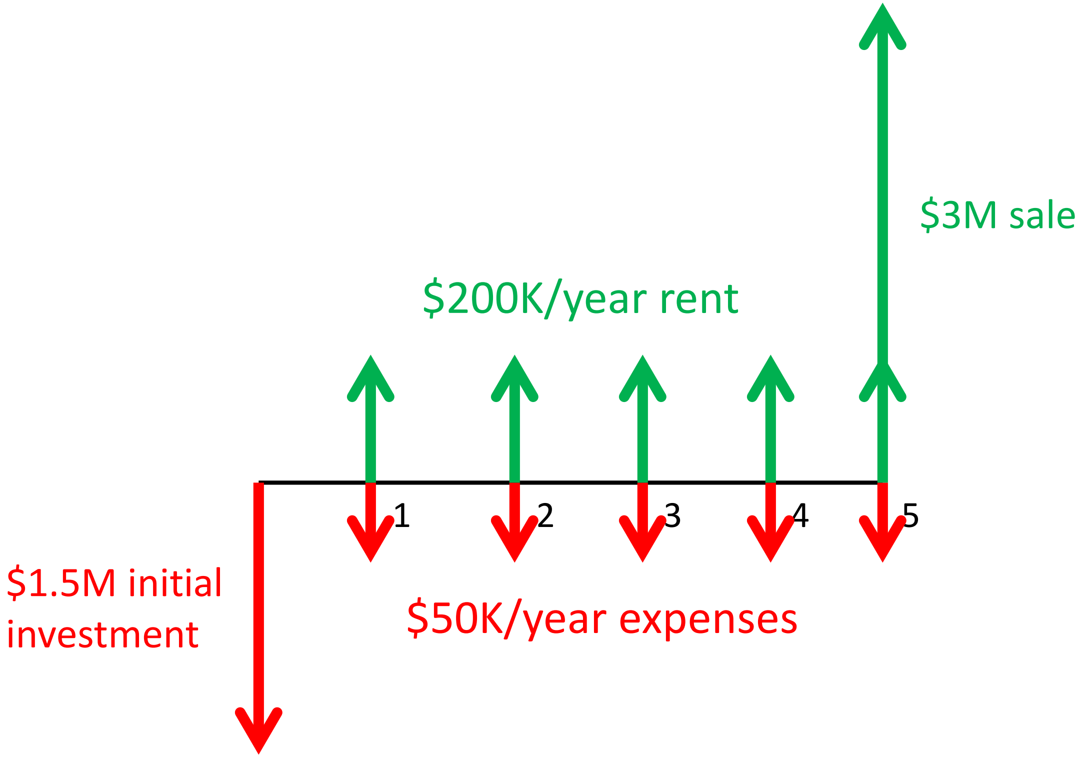
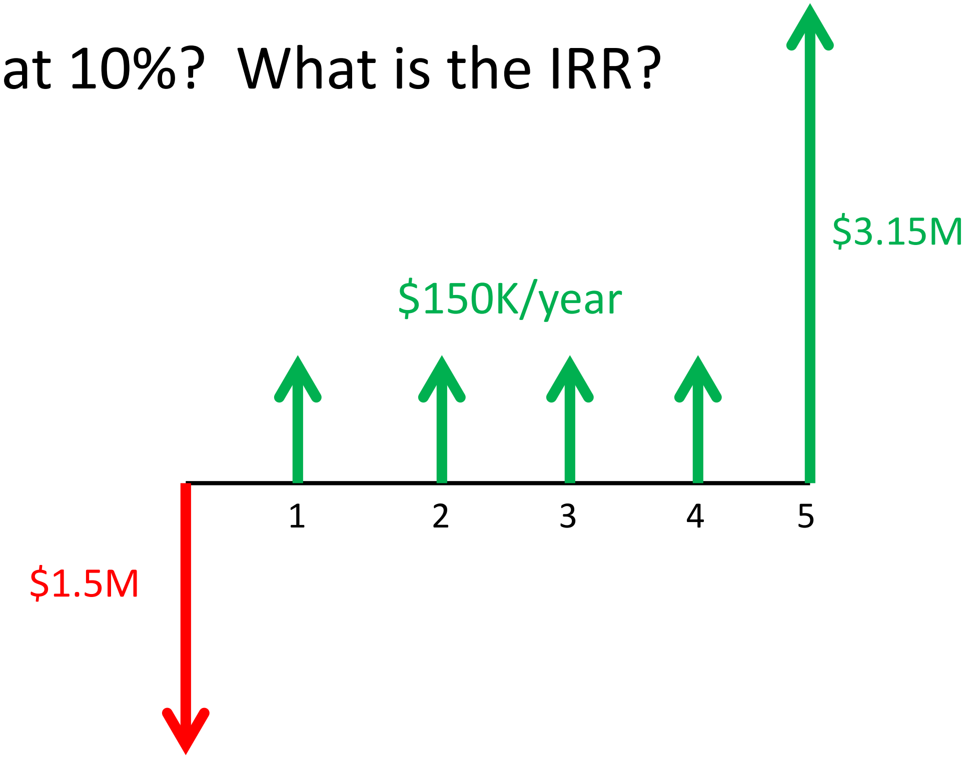


What is the NPV at 10%? What is the IRR?



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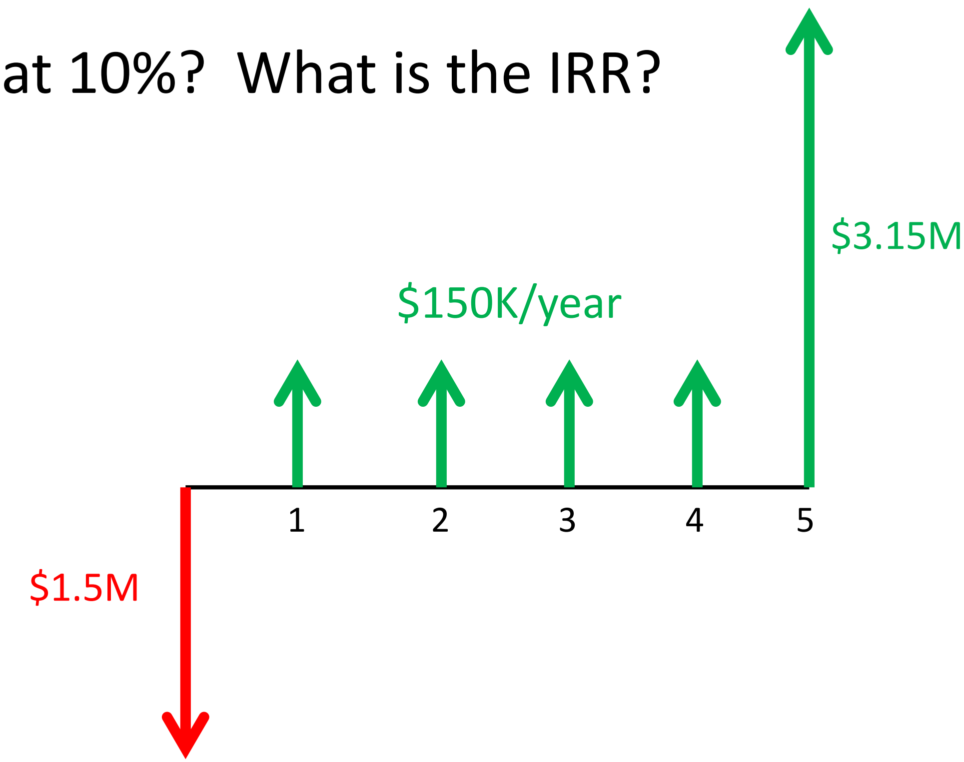


This is easiest to calculate using the irregular cash flow function on the HP-12c.

CF0 = –1.5M, CF1 = $150K, N1 = 4, CF2 = 3.15M.

NPV @ 10% = $931,381.98

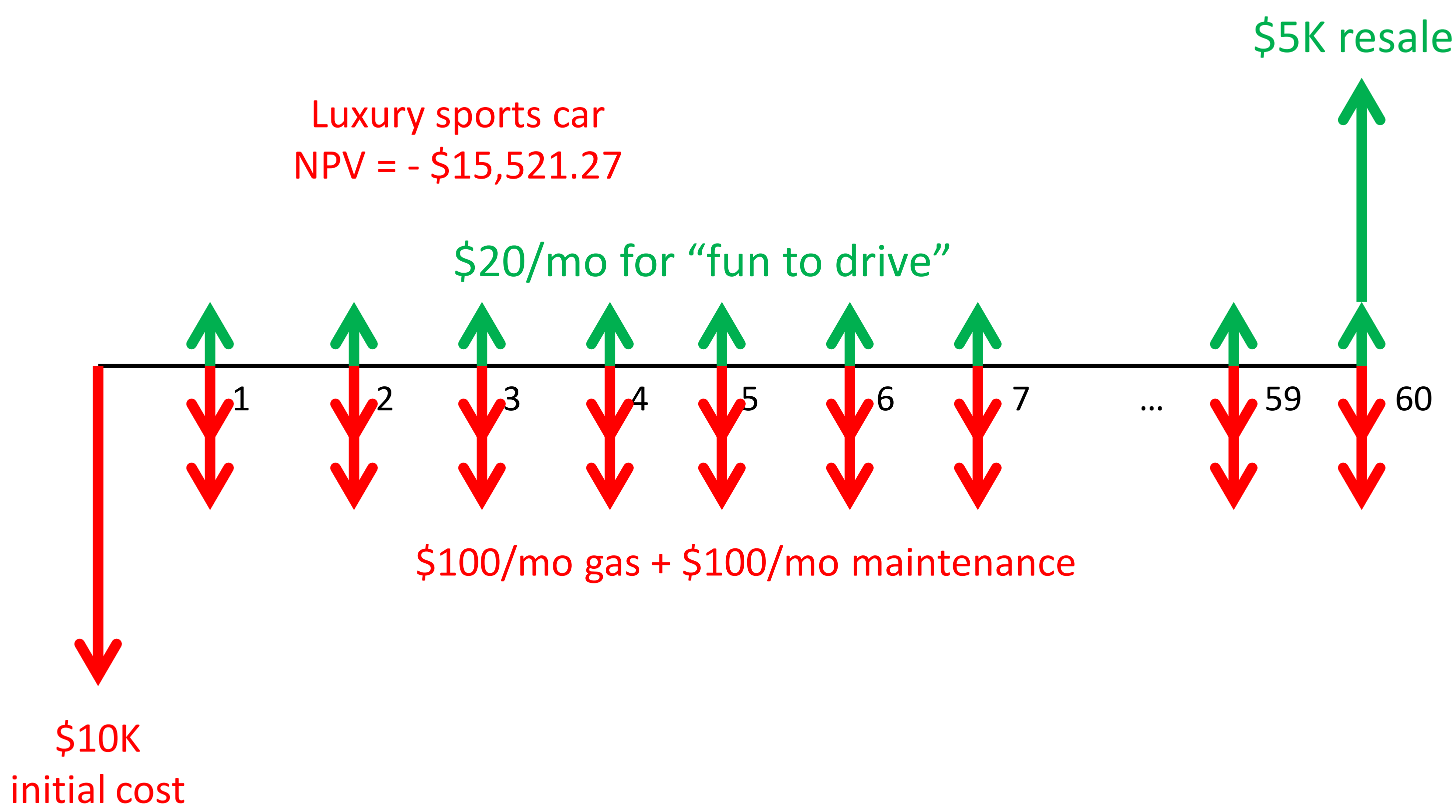
IRR = 22.74%

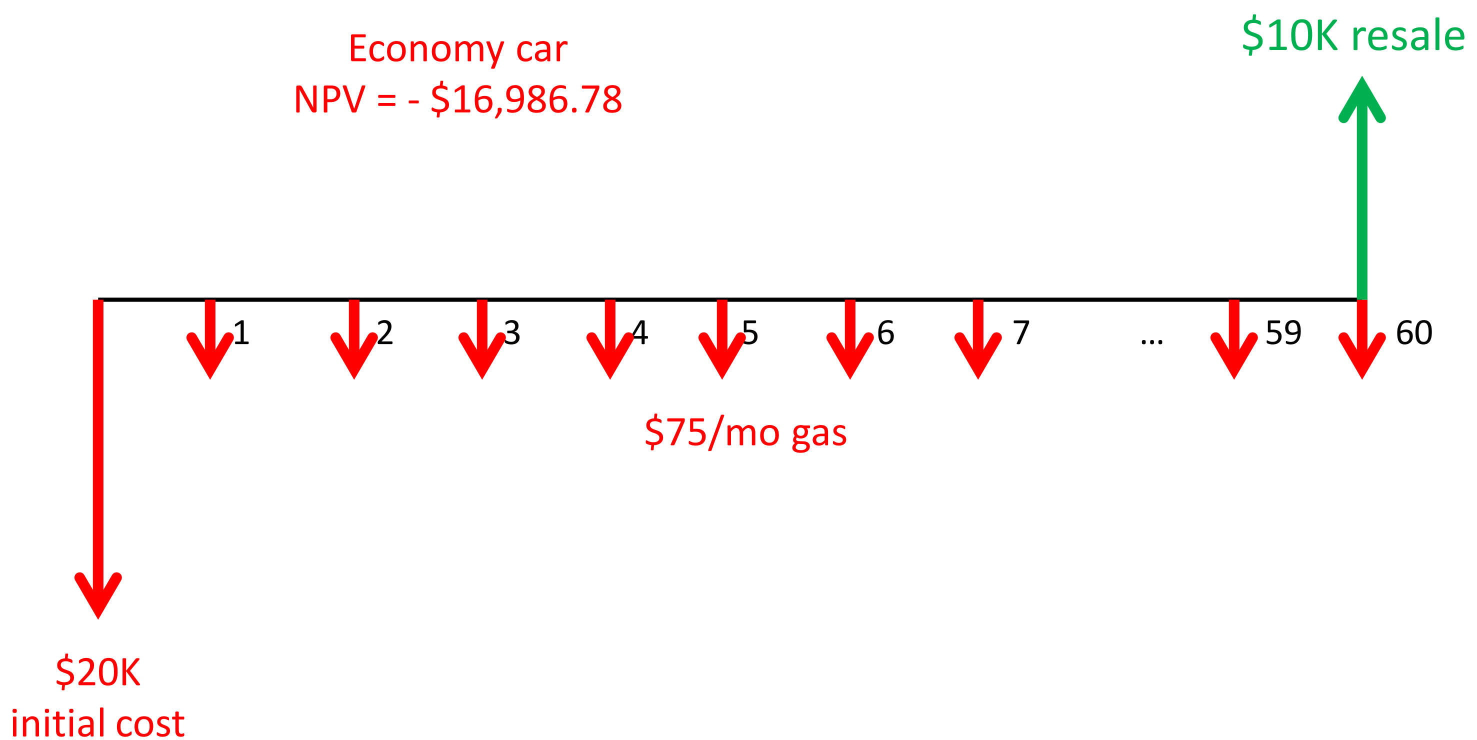
You need to buy a new car. You have two options.

1. For $10K, you can buy an older luxury sports car that will cost you $100/mo in gas + $100/mo in maintenance.
2. For $20K, you can buy a new economy car that will cost you $75/mo in gas and comes with free maintenance.

The sports car would be more fun to drive and you estimate that to be worth $20/mo.

Regardless of which you choose, you expect to keep the car for 5 years. At the end of 5 years, you expect you could sell either car for 1/2 the original You've decided to use the 8% APR you expect to get on a car loan as your discount rate. Which would you choose?


$5K resale
Luxury sports car
NPV = - $15,521.27
$20/mo for "fun to drive"
1
2
3
4
5
6
7
...
59
60
$100/mo gas + $100/mo maintenance
$10K
initial cost


Economy car
NPV = - $16,986.78
$10K resale
1
2
3
4
5
6
7
...
59
60
$75/mo gas
$20K
initial cost

You've opened a new bakery with an initial investment of $80,000. You project it should generate $10,000/mo in sales the first 3 months, $16,000 in month 4, then $20,000/mo after that. Operating costs are expected to be $14,000/mo the first 3 months, then $12,000/mo after that. You plan disbursements of $18,000/mo in equipment and other capital purchases the first 4 months. Create a cash flow schedule for the first 6 months.

Here is the cash flow schedule. Notice that equipment purchases are depreciated and are not subtracted from operating income.

Amounts are in thousands of dollars.

Month	1	2	3	4	5	6
Starting cash	80	58	36	14	0	8
Sales	10	10	10	16	20	20
Operating costs	(14)	(14)	(14)	(12)	(12)	(12)
Operating income	(4)	(4)	(4)	4	8	8
Equipment	(18)	(18)	(18)	(18)		
Ending cash	58	36	14	0	8	16