

	Mac	Cover Girl	Revlon	Neutrogena	Chanel	Totals
Teenage Women	645	455	786	375	239	2,500
Adult Women	1123	2908	4357	2431	1181	12,000
Senior Women	609	1125	1357	953	956	5,000
Totals	2,377	4,488	6,500	3,759	2,376	19,500

SET ONE (SET TWO ANSWERS ON PAGE 3)

- #1 $P(\text{Senior Woman}) = 5,000/19,500$
- #2 $P(\text{Senior Woman and Prefers Cover Girl}) = 1,125/19,500$
- #3 $P(\text{Prefers Neutrogena/Senior Woman}) = 953/5,000$
- #4 $P(\text{Prefers Revlon/Teenage Woman}) = 786/2,500$ Notice: No overlap of events in #6
- #5 $P(\text{Senior Woman/Prefers Chanel}) = 956/2,376$ #7 4,357 were both adult women and prefers Revlon
- #6 $P(\text{Prefers Cover Girl OR Prefers Mac}) = 4,488/19,500 + 2,377/19,500 - 0 = 6,865/19,500$
- #7 $P(\text{Adult Woman OR Prefers Revlon}) = 12,000/19,500 + 6,500/19,500 - 4,357/19,500 = 14,143/19,500$
- #8 $P(\text{Not a Teenage Women}) = 1 - P(\text{Teenage Woman}) = 19,500/19,500 - 2,500/19,500 = 17,000/19,500$
- #9 $P(\text{Teenage Women/Prefer Cover Girl}) = 455/4,488$
- #10 $P(\text{Prefer Revlon/Senior Women}) = 1,357/5,000$ Note: Always read "proportion" simply as probability

HERE'S A PRACTICE PROBLEM FOR ESTIMATING A FUTURE ANNUAL INCOME, NPV & IRR

#1 Show the 3rd year income statement for the apartment building described below.

- * Apartment building has 14 two bedroom units that each rent for \$1,700 per month
- * Rents are projected to increase at 3% per year
- * Vacancy and collection loss is estimated at 10% of annual gross income
- * Annual expenses for the first year will \$60,000, and will increase 5% per year thereafter.

#2 Use the following annual net income figures and projected sale price to answer these two NPV and IRR questions.

Year One	\$56,000
Year Two	\$59,000
Year Three	\$67,000
Year Four	\$72,000
Year Five	\$90,000

The property is sold for \$950,000 at the end of the fifth year.

- #2A Find the net present value for this investment if you want to earn an 8% return.
- #2B Find the internal rate of return if you pay \$1,000,000 for this investment.

HERE'S THE ANSWERS TO THE PRACTICE FINANCIAL FUNCTIONS PROBLEMS FROM FRIDAY'S CLASS

#1		Year One	Year Two	Year Three
	Gross Annual Income	\$285,600	\$294,168	\$302,993
	Vacancy & Collection Loss	\$28,560	\$29,417	\$30,299
	Annual Effective Gross Income	\$257,040	\$264,751	\$272,694
	Annual Expenses	\$60,000	\$63,000	\$66,150
	Annual Net Income	\$197,040	\$201,751	\$206,544

#2	Year One	\$56,000	
	Year Two	\$59,000	
	Year Three	\$67,000	
	Year Four	\$72,000	
	Year Five	\$1,040,000	= \$90,000 + \$950,000

#2A Net Present Value (NPV) **\$916,350**

#2B	Year 0	-\$1,000,000
	Year One	\$56,000
	Year Two	\$59,000
	Year Three	\$67,000
	Year Four	\$72,000
	Year Five	\$1,040,000

Internal Rate of Return (IRR) **5.9%**

	Mac	Cover Girl	Revlon	Neutrogena	Chanel	Totals
Teenage Women	645	455	786	375	239	2,500
Adult Women	1123	2908	4357	2431	1181	12,000
Senior Women	609	1125	1357	953	956	5,000
Totals	2,377	4,488	6,500	3,759	2,376	19,500

SET TWO ANSWERS

#1 $P(\text{Prefers Neutrogena}) = 3,759/19,500$

#2 $P(\text{Teenage Woman and Prefers Revlon}) = 786/19,500$

#3 $P(\text{Prefers Revlon/Adult Woman}) = 4,357/12,000$

#4 $P(\text{Prefers Revlon/Adult Woman}) = 4,357/12,000$ (sorry for duplicate)

Notice: No overlap of events in #6

#5 $P(\text{Prefers Chanel/Senior Women}) = 956/5,000$

#7 1,181 were both adult women and prefers Revlon

#6 $P(\text{Prefers Chanel OR Prefers Cover Girl}) = 2,376/19,500 + 4,488/19,500 - 0 = 6,864/19,500$

#7 $P(\text{Adult Woman OR Prefers Chanel}) = 12,000/19,500 + 2,376/19,500 - 1,181/19,500 = 13,195/19,500$

#8 $P(\text{Does not prefer Revlon}) = 1 - P(\text{Prefers Revlon}) = 19,500/19,500 - 6,500/19,500 = 13,000/19,500$

#9 $P(\text{Teenage Women/Prefer Chanel}) = 239/2,376$

#10 $P(\text{Prefer Mac/Teenage Women}) = 645/2,500$

Note: Always read "proportion" simply as probability



