BUS-123 Spring 2015
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Future Value Exercises

Name: KEY
Chap 1, 3, Lecture Notes

Future Value of a Lump Sum Investment	Future Value of a Series of Investments
$\text{Future Value} = \text{Principal} * (1 + \text{Rate})^{\text{Time}}$	$\text{Future Value} = \text{Deposit} * \frac{(1+\text{Rate})^{\text{Time}} - 1}{\text{Rate}}$

1) Your grandaunt, Isabelle Ringing, just recently passed away and left you, her favorite grand-neice/grand-nephew, $10,000. She always told you how important it was to save money for a rainy day. Resisting the urge to blow the entire amount on durable and non-durable consumer items, you put the money into an investment that earns 10% over 10 years. How much will you have at the end of 10 years? Is this enough for a car or a down payment on a house?

$10000
10%
10 years

single investment
lump sum investment
lump sum principal
"Top Table"

→ 10%
↓ 2.594
10 years "future value multiplier"

$10000 single investment
* 2.594
$25,940 after 10 years

2) Ben Dover is thirty years old. This year, he plans to start putting $5,000 per year into a Roth IRA *(What's a Roth IRA? It's a retirement account.)* and will continue to do so until age sixty, a total of 30 years. At 10% annually, how much will Ben have in his Roth IRA?

$5000 per year
10%
30 years

series of deposits
stream of investments
stream of payments
"Bottom table"

→ 10%
↓ 164.494
30 years "future value multiplier"

$5000 per year
*164.494
$822,470 after 30 years

How much did he invest over 30 years?
$5000 per year
* 30 years
$150000 invested

3) Eileen Forward, Ben's cousin, is 20 years old. She puts $5,000 into a Roth IRA until age 30, only 10 years and then stops making contributions. With the same 10% annual rate, how much will Eileen have at age 60? (Hint: You'll need both future value tables.) Since Ben is saving $5,000 for 30 years while Eileen is only saving $5,000 for 10 years, Ben is sure that he'll have much more money than Eileen. Is he right?

$5000 per years
10%
10 years, then stop and hold for 30 years

(1) age 20 → age 30
series of deposits
$5000 per year
10% - 10 years
$5000
* 15.937
$79685 after 10 years

holds for 30 years

(2) lump sum principal
$79685
10% - 30 years
$79685
* 17.449
$1,390,423.50

How much did she invest?
$5000 per year
* 10 years
$50000 invested

4) Neil Downe, their friend, is 18 years old. He is already a Fourbucks, uh, Fivebucks, sorry, $tarbucks addict. He stops by there at least once a day. Ben & Eileen are trying to get him to give up his habit and place the money into a Roth IRA. If he puts just $2 per day, $60 per month, into the same Roth IRA, how much will he have at age 68? What if he saves $5 per day, $150 per month?

$5 per day
$150 per month
$1800 per year
10% - 50 years

series of deposits
$1800 per year
10% - 50 years

$1800
* 1163.909
$2,095,036.20!

How much did he invest?
$1800 per year
15 years
$90000 invested

5) Now try some other compound rates of return. Recalculate the above problems for 5%, 8%, 12% and 13%.