Spring Semester Financial Functions Practice #1 Annotated Answers
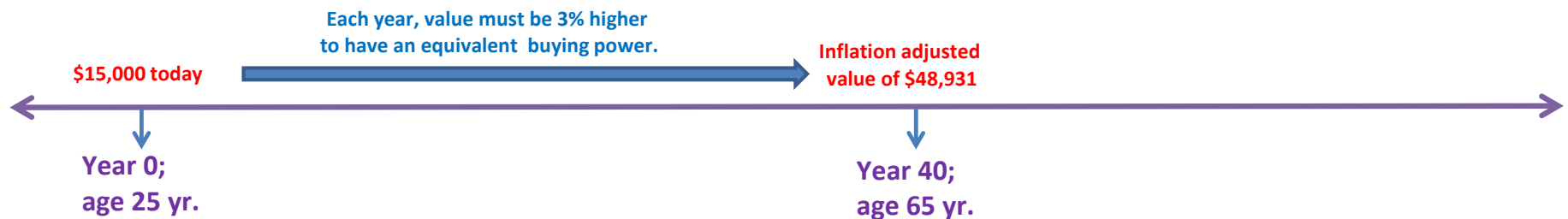
If you understand these problems, you'll do great on Spring Midterm #1.

#1A DETERMINE TARGET RETIREMENT INCOME

Output = FV "inflation-adjusted value when you reach the age of 65 years"

($48,931)

Inputs: n = 40 years (65-25); PV = $15,000 ("current value . . . In today's dollars"); rate = 3% ("inflation rate")

**Each year, value must be 3% higher
to have an equivalent buying power.**

$15,000 today

**Inflation adjusted
value of $48,931**

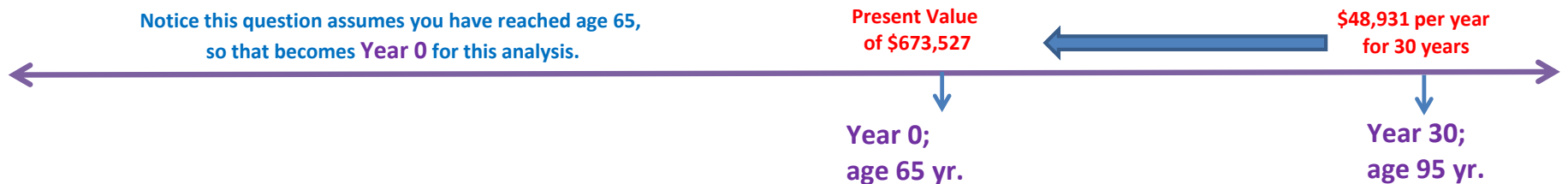**Year 0;
age 25 yr.**

**Year 40;
age 65 yr.**

#1B DETERMINE TARGET RETIREMENT SAVINGS

Output = PV "How much savings "   (Note this question assumes you are now 65 years old, so "present" is now Year 40.)

($673,527)

Inputs: PMT = $48,931 ("target income per year"); n = 30 ("you plan to live another 30 years'); rate = 6%   **NOTICE: PER YEAR always is a PMT**
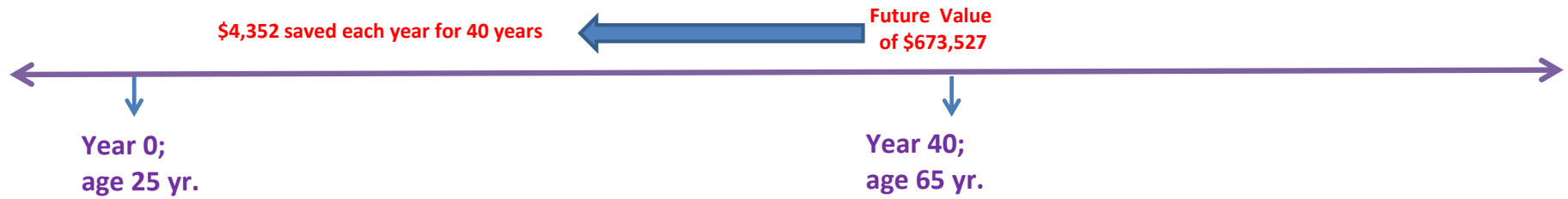
**Notice this question assumes you have reached age 65,
so that becomes Year 0 for this analysis.**

**Present Value
of $673,527**

**$48,931 per year
for 30 years**

**Year 0;
age 65 yr.**

**Year 30;
age 95 yr.**

#1C **DETERMINE REQUIRED ANNUAL SAVINGS**

Output = PMT ("how much must be saved each year")   **NOTICE: PER YEAR always is a PMT**
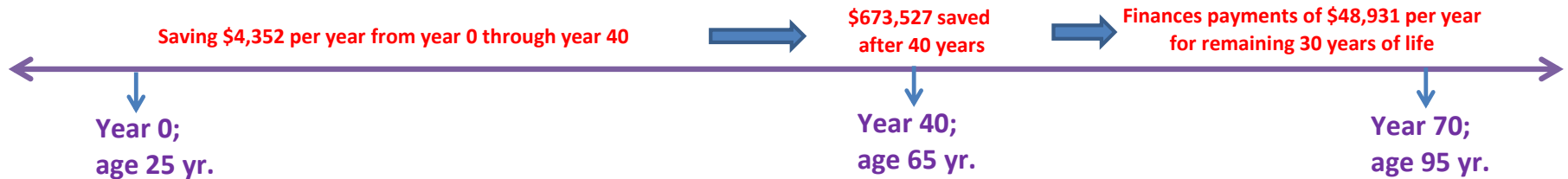
($4,352)

Inputs: FV = $673,527 "(target retirement savings goal)"; n = 40 years (65 - 25); rate = 6%

$4,352 saved each year for 40 years   **Future Value**
of $673,527

Year 0;
age 25 yr.

Year 40;
age 65 yr.

Timeline Conclusions For Question One

Saving $4,352 per year from year 0 through year 40   **$673,527 saved**
after 40 years   **Finances payments of $48,931 per year**
for remaining 30 years of life

Year 0;
age 25 yr.

Year 40;
age 65 yr.

Year 70;
age 95 yr.

#2A No Excel Financial Functions required this first part, just multiply the "salary at retirement" by 70%.

Salary at retirement	**$60,000**
	X 70%
Annual Retirement Payment	**$ 42,000**

#2B

Output = PV "how much must the company have saved"

($468,641)

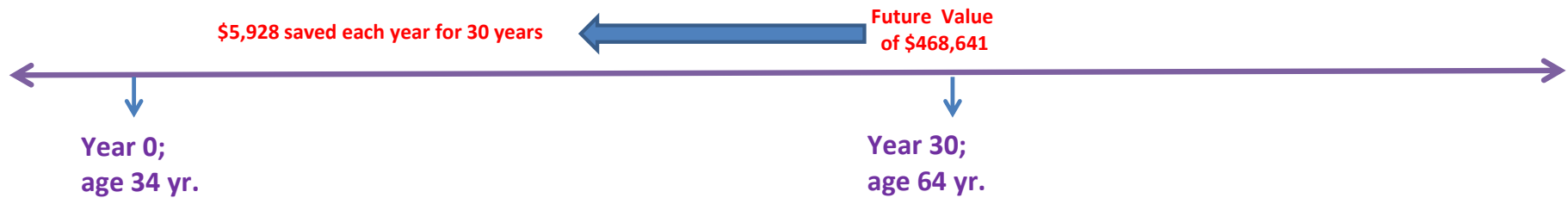Inputs: PMT = $42,000 ("annual payment"); rate = 6%; n = 19 years (83 - 64)

**Notice this question assumes the worker has completed 30 years of service,
so that becomes Year 0 for this analysis.**

**Present Value
of $468,641**

**$42,000 per year
for 19 years**

**Year 0;
age 64 yr.**

**Year 19;
age 83 yr.**

#2C

Output = PMT "how much must the company deposit every year"   **NOTICE: EVERY YEAR = PMT**

($5,928)

Inputs: FV = $468,641 ("savings target"); n = 30 years ("will have worked 30 years at the company"); rate = 6%

$5,928 saved each year for 30 years

**Future Value
of $468,641**

**Year 0;
age 34 yr.**

**Year 30;
age 64 yr.**

#2D   No Excel Financial Functions required this first part, just subtract $2,000 from the fixed annual benefit cost ("how much must the company deposit every year").

Fixed Benefit Annual Cost	**$5,928**
	less $2,000
Annual Retirement Payment	**$ 3,928**

#2 BONUS   The significant change in this scenario is that the company will have to pay the emploee $42,000 for 28 years (83 - 55) rather than 19 years.

The first step is to recalculate the change in the total amount that must be saved by the company.

Output = PV "how much must the company have saved"

($563,059)

Inputs: PMT = $42,000 ("annual payment"); rate = 6%; n = 28 years (83 - 55)

The second step is to recalculate the annual amount that must be saved to attain this savings target.

Output = PMT "how much must the company deposit every year"   **NOTICE: EVERY YEAR = PMT**

($7,122)

Inputs: FV = $563,059 ("savings target"); n = 30 years ("will have worked 30 years at the company"); rate = 6%
THEREFORE, the company must save $7,122 per year to meet its obligatioins.

#3   Output = PMT "monthly payment"   **REMEMBER: FOR ALL LOANS, DO MONTHLY**

($1,572)

Inputs: PV = $350,000 (loan amount); rate = 3.5%/12; n = 30*12

#4   Output = PV "how much should an investor pay"; always assumes the investor will buy the bond today.

($16,221.34)

Inputs: FV = $20,000; rate = 7%; n = 16 years; PMT = $1,000

#5   Output = PV "how much can you borrow", loan amount

($377,144.89)

Inputs: PMT = $95,000 per year * 35% / 12;   **NOTE: *35% allocates annual income to annual payment**
rate = 3.9%/12; n = 15*12   **Dividing by 12 converts annual payment to monthly payment**

#6   Output = NPV ("net present value")

$944,464.67

Input:			
Year One	$80,000	Rate = 8%	
Year Two	$87,000		
Year Three	$96,000	**4th year income includes income from operations of $99,000**	
Year Four	$979,000	**+ $880,000 from proceeds of selling property = $979,000**	

#7   Output = IRR ("internal rate of return")

    4.1%   **Note: Before the clock starts (time 0), you buy the property for $875,000.**

    Input: Year 0   -$1,075,000   **Input the purchase price as a negative number, $ going out .**

        Year One $80,000

        Year Two $87,000   **BE SURE TO ROUND % ANSWER TO NEAREST TENTH**

        Year Three $96,000   **NO input required for "Guess" in function box.**

        Year Four $979,000

#8

	Year 1	Year 2	Year 3	Year 4	
Annual Gross Income					
One-Bedroom Units	$114,000	$121,980	$130,519	**$139,655**	Increase each year gross income 7% by multiplying by 1.07
Two-Bedroom Units	$84,000	$89,880	$96,172	**$102,904**	Increase each year gross income 7% by multiplying by 1.07
Laundry income	$750	$788	$827	**$868**	Increase each year gross income 5% by multiplying by 1.05
Total	$198,750	$212,648	$227,517	**$243,427**	Add the three sources of income
Vacancy & Collection Loss (6%)	$11,925	$12,759	$13,651	**$14,606**	Multiply each year annual gross income by 6%
Annual Effective Gross Income	$186,825	$199,889	$213,866	**$228,821**	Subtract vacancy and collection loss from annual gross income for each year
Annual Expenses					
Real Estate Taxes	$12,000	$12,240	$12,485	**$12,734**	Increase each year expense 2% by multiplying by 1.02
Insurance	$5,000	$5,300	$5,618	**$5,955**	Increase each year expense 6% by multiplying by 1.06
Utilties	$35,000	$37,450	$40,072	**$42,877**	Increase each year expense 7% by multiplying by 1.07
Maintenance	$11,000	$11,440	$11,898	**$12,374**	Increase each year expense 4% by multiplying by 1.04
Reserves/Other	$4,000	$4,160	$4,326	**$4,499**	Increase each year expense 4% by multiplying by 1.04
Total	$67,000	$70,590	$74,398	**$78,439**	Add the five sources of expenses for each year.
Annual Net Income	$119,825	$129,299	$139,468	**$150,382**	Subtract total expenses from effective gross income for each year