Applications

1a. The maximum Social Security was $7,347, but no maximum on Medicare, and FICA includes both.

1. In 2016, the maximum taxable income for Social Security was $118,500. The tax rates were 6.2% for Social Security and 1.45% for Medicare.

a. What is the maximum anyone could have paid into FICA tax in the year 2016? See margin.

b. Bill had two jobs in 2016. One employer paid him $77,090 and the other paid him $31,280. Each employer took out 6.2% for Social Security. How much did Bill overpay in Social Security for 2016? $0, since 108,370 < 118,500

2. In 1990, the amount of earnings required to earn one Social Security credit was $520. In the tax year 1990, Maggie earned $187 biweekly. How many Social Security credits did she earn in 1990? 4

3. Anna turned age 62 in 2016, and she is computing Social Security benefits. Using the formula from Example 3 in Section 10-2, compute her Social Security full retirement benefit if her average monthly salary over her 35 highest-paying years was $3,766. Round to the nearest dollar. $1,701.60

4. Nick's annual salary is $90,000. His employer matches his 401(k) contributions at $0.75 for each dollar up to 8% of his annual salary. Nick contributes $350 from each biweekly paycheck to his 401(k) account. What is the combined total of his annual contribution and his employer's contribution? $14,500

5. Juanita started collecting Social Security at age 65. Her Social Security full monthly retirement benefit is $2,128. Her benefit is reduced since she started collecting before age 66. Using the reduction percentages from Example 4 in Section 10-2, find her approximate monthly Social Security benefit to the nearest dollar. $1,985

6. Charleen is single. She is filling out the Social Security worksheet shown on page 624 so she can determine the amount of her Social Security benefits that she will pay federal income tax on. The following lines were taken from her tax information.

- Line 1—She received $38,121 in Social Security benefits.
- Line 3—The total of her other sources of income is $23,907.
- Line 4—The amount from line 8b is $450.
- Line 6—The total to enter is $3,211.

How much of Charleen's Social Security benefit must she pay federal income tax on? $9,775.53

7. Reliable Insurance Company offers a term life insurance policy with a renewable annual premium. The first-year premium is $795. Premiums increase by 4.1% each year. What will premiums be in the nth year? $795(1.041)^{n-1}$

8. Alex took out a 15-year term life insurance policy with a face value of f dollars. Over the lifetime of the policy, he pays monthly payments of m dollars. He dies after making payments for 1½ years. Express algebraically the difference between the amount Alex paid in premiums and the amount his beneficiaries received when he died. $f-18m$

9. Paul has a universal life insurance policy with a face value of f dollars. The current cash value of the policy is c dollars. The premium is m dollars per month. He is going to use the cash value to pay for premiums for as long as it lasts. In those months the cash value will earn i dollars in interest. Express algebraically the number of months the cash value can be used to pay the premium. $\left[\frac{(c+i)}{m}\right]$

Exact Age	Death Probability	
	Males	Females
62	0.014123	0.08959
63	0.015312	0.09747
64	0.016567	0.010582
65	0.017976	0.011511
66	0.019564	0.012572
67	0.021291	0.013772

a. If the company insures 10,000 63-year-old males, how many are expected to die before their 64th birthday? Round to the nearest integer. 153

b. Based on the table, what is the probability that a 63-year-old male will live to his 64th birthday? $1 - 0.015312 = 0.984688$

11. The Lieberman Insurance Company sells a 5-year term insurance policy with face value of $250,000 to a 39-year-old man for an annual premium of $973. The mortality table is given below.

Age at Death	40	41	42	43	44	Age >44
Mortality Rate	0.0008	0.0009	0.0011	0.0012	0.0013	p

a. Assume the policyholder pays the premium annually. What is the insurance company profit on this policy for each year of death? See margin.

b. What is the expected profit from selling one of these policies? Round to the nearest cent. $3,530.95

c. What is the company's expected profit from selling 5,000 of these policies? $17,654,750

12. Deanna is 62 years old. She plans to retire in 3 years. She has $300,000 in a savings account that yields 2.25% interest compounded daily. She has calculated that her final working year's salary will be $94,000. She has been told by her financial advisor that she should have 65% of her final year annual income available for use each year when she retires.

a. What is the income that her financial advisor feels she must have per year once she retires? $61,100

b. Use the compounding formula to determine how much she will have in her account at the ages of 63, 64, and 65. Round to the nearest cent. See margin.

c. Assume that Deanna is planning on using 60% of her final salary in each of her first 5 years of retirement. What should that annual amount be? $54,400

d. Deanna has decided that she will need $20,000 each year from her savings account to help her reach her desired annual income during retirement. Will Deanna be able to make withdrawals of $20,000 from her savings account for 20 years? Explain your reasoning. See margin.

13. Mitch opened a retirement account that has an annual rate of 2.2% compounded annually. He is planning on retiring in 13 years. How much must he deposit into that account each year so that he can have a total of $1,000,000 by the time he retires? Round to the nearest $10,000 dollars. approx. $70,000

Exercise 12

This problem can be solved in a variety of ways. You might want to use this part of exercise 12 as an in-class activity or assign it for homework and then spend some time reviewing how students interpreted and approached the solution. Some students may just say that $20,000 per year for 20 years is $400,000, which is over the amount that she has in the account. But the question needs to be raised whether or not the continued daily interest of 2.25% might bring in enough money to meet the goal. Ask students how a spreadsheet might be helpful. Then walk them through the set-up for 20 years of $20,000 withdrawals with the account still gaining 2.25% daily on the balance.

ANSWERS

11a. −$249,027, −$248,054 −$247,081, −$246,108 −$245,135, $4,865

12b. $306,826.30; $313,807.92; $320,948.41 respectively

12d. Use a spreadsheet to calculate the answer to this question. The answer depends upon when Deanna withdraws the $20,000. If Deanna withdraws the $20,000 immediately upon retirement with $320,948.41 in the account, she will not have enough to last 20 years. But, if she withdraws the first $20,000 at the end of her first year of retirement, she will have enough.

14. Hillary's employer offers an annual pension benefit for employees that have worked for the company for more than 10 years. The benefit is calculated by multiplying 5.08% of the career average salary by the number of years that exceeds 10 that the employee has worked for the company. Hillary's salary for the first 5 years was $26,745. After that she earned the following salaries:

29,000	29,400	30,100	32,500	32,500	33,200	33,400	34,700
35,000	35,000	35,000	35,000	36,700	38,000	39,000	39,500

a. What is Hillary's career average salary? $32,463.10
b. What is Hillary's annual pension under this plan? $18, 140.38
c. What percentage of her final annual salary will her annual retirement salary be? Round your answer to the nearest percent. approx. 46%

15. Hannah contributed $300 per month into her retirement account in pre-tax dollars during the last tax year. Her taxable income for the year was $72,000. She files taxes as a single taxpayer.

a. What would her taxable income have been had she contributed to the account in after-tax dollars? $75,600

15b. pre-tax: $13,800; after-tax: $14,700

b. Use the tax tables on the right to calculate her tax in both the pre-tax and after-tax contribution situations. See margin.

c. How much did Hannah save in taxes during that year? $900

At least	But less than	Single
72,000		
72,000	72,050	13,800
72,050	72,100	13,813
72,100	72,150	13,825
72,150	72,200	13,838
72,200	72,250	13,850
72,250	72,300	13,863
72,300	72,350	13,875
72,350	72,400	13,888
72,400	72,450	13,900
72,450	72,500	13,913
72,500	72,550	13,925
72,550	72,600	13,938
72,600	72,650	13,950
72,650	72,,00	13,963
72,700	72,750	13,975
72,750	72,800	13,988
72,800	72,850	14,000
72,850	72,900	14,013
72,900	72,950	14,025
72,950	73,000	14,038

At least	But less than	Single
75,000		
75,000	75,050	14,550
75,050	75,100	14,563
75,100	75,150	14,575
75,150	75,200	14,588
75,200	75,250	14,600
75,250	75,300	14,613
75,300	75,350	14,625
75,350	75,400	14,638
75,400	75,450	14,650
75,450	75,500	14,663
75,500	75,550	14,675
75,550	75,600	14,688
75,600	75,650	14,700
75,650	75,700	14,713
75,700	75,750	14,725
75,750	75,800	14,738
75,800	75,850	14,750
75,850	75,900	14,763
75,900	75,950	14,775
75,950	76,000	14,788

16. Regina is a 45-year-old supervisor for a communications company. Her tax filing status is married filing separately. She withdrew $50,000 from her tax-deferred retirement account to pay off her loans. Regina's taxable income for that year was $100,040, excluding the $50,000 early withdrawal from her retirement account.

a. Use the tax computation worksheet shown to calculate Regina's tax had she not made the early withdrawal. $21,536.95

Section C–Use if your filing status is **Married filing separately.** Complete the row below that applies to you.

Taxable income If line 43 is–	**(a)** Enter the amount from line 43	**(b)** Multiplication amount	**(c)** Multiply (a) by (b)	**(d)** Subtraction amount	**Tax** Subtract (d) from (c). Enter the result here and on Form 1040, line 44
At least $100,000 but not over $115,225	$	x 28% (0.28)	$	$ 6,474.25	$
Over $115,225 but not over $205,750	$	x 33% (0.33)	$	$12,235.50	$
Over $205,750 but not over $232,425	$	x 35% (0.35)	$	$16,350.50	$
Over $232,425	$	x 39.6% (0.396)	$	$27,042.05	$

b. Use the worksheet to calculate her tax with an increase in her taxable income of $50,000. $37,277.70

c. How much more in taxes did she pay because of the early withdrawal? $15,740.75

d. How much was her early withdrawal 10% penalty? $5,000

17. Circuit Technologies offers their employees a flat pension plan in which a predetermined dollar amount (multiplier) is multiplied by the number of years of service to determine the monthly pension benefit using the schedule shown.

Years Employed	Multiplier
15–19	$52
20–25	$57
30+	$60

After working at Circuit for 23 years, Jane is considering leaving her current job. She has been told that there will be a 2.05% cost of living adjustment (COLA) to the multiplier soon after she retires. Calculate Jane's pension before and after the COLA adjustment. Before with 23 years: $1,311; after with 23 years: $1,337.91

18. Petra's employer offers an annual pension benefit calculated by multiplying 2.46% of the career average salary times the number of years employed. Here are Petra's annual salaries over the last 16 years of employment:

54,000	54,000	55,100	55,800	55,800	56,200	56,400	57,000
60,000	61,000	61,000	61,000	61,700	62,000	63,000	63,500

a. What is Petra's career average salary? $58,593.75

b. What is Petra's annual pension under this plan? $23,062.50

c. What percentage of her final annual salary will her annual retirement salary be? Round your answer to the nearest percent. 36%

d. What is Petra's monthly pension benefit? Round your answer to the nearest penny. $1,921.88

19. NuEditions Book Company uses a final average salary formula to calculate an employee's pension benefits. The amount used in the calculations is the salary average of the final 3 years of employment. The retiree will receive an annual benefit that is equivalent to 1.75% of the final average multiplied by the number of years of employment. Mike and Kristy are both retiring at the end of this year. Calculate their annual retirement pension given the following information:

Mike: Years of employment: 25; $35,140.83

Final three annual salaries: $84,780, $84,900, $85,000

Kristy: Years of employment: 27; $35,122.50

Final three annual salaries: $71,600, $73,400, $78,000

20. Esteban's employer offers a pension plan that calculates the annual pension as the product of the final average salary, the number of years of service, and a 2% multiplier. His employer uses a graded vesting formula according to the schedule shown. Esteban has decided to change jobs after 3 years of service. What percent of his pension will he receive when he retires? 45%

Years Employed	Vesting Percentage
0	0%
1	0%
2	28%
3	45%
4	78%
5	100%