2.4-2.5 Loan Payments and Income Taxes - <mark>SOLUTIONS</mark>

Group Activity

Use a spreadsheet to work on these problems. Write down the syntax to show your work. Answer each question in a complete sentence.

1. Sam has a student loan of $30,000 at a fixed APR of 4.45%. If they want to pay it off in 15 years,

    a. How much would they pay per month?

=PMT(0.0445/12, 15*12, 30000, 0)
= $228.73
They would need to pay $228.73 per month for 15 years.

    b. How much would they pay in total?

=$228.73*15*12
= $41,171.40
They would pay a total of $41,171.40 for the loan.

    c. What percentage of the total was paid toward the loan amount of $30,000 and what percentage was paid toward interest?

Percentage toward the principal:
=$30,000/41,171.40
≈ 73%
About 73% of the total was paid toward the principal. That means about 27% was paid in interest.

2. You want to buy a $350,000 home. You plan to put 10% down and take out a 30-year fixed mortgage on the rest.

    a. What will the loan amount be?

Amount of down payment: 0.10(350,000) = $35,000
Loan amount = $350,000 – $35,000 = $315,000
The loan amount is $315,000.

    b. What will your monthly payment be if the interest rate is 4.5%?

=PMT(0.045/12, 30*12, 315000, 0)
= $1,596.06
My monthly mortgage payment would be $1,596.06.

c. If you make all the payments for 30 years, how much would you have paid for the house in total?

=$1,596.06*30*12 + $35,000
= $574,581.60 + $35,000
If I owned the house for 30 years I would pay $609,581.60.

d. In part b above, what number would you get if you switch the 0 and the 315,000? Why are the answers so different? Explain the difference between these two scenarios.

=PMT(0.045/12, 30*12, 0, 315000)
= $414.81

In part b, we are making loan payments that include interest in addition to the principal of $315,000. The present value is $315,000 and the future value is $0.

Part d is different because we switched the present value to $0 and the future value to $315,000. In this case we would be depositing $414.81 per month to save up to $315,000. Interest is working with us instead of against us.

Section 2.5 Federal Income Taxes - <mark>SOLUTIONS</mark>

Group Activity

Using the tax tables, calculate the values for each household and determine the amount they owe or will be refunded.

2018 Tax Year	Dakota and Avery (no children)	Letitia (2 children)
Filing Status	Married Filing Jointly	Single (Single means she is not claiming her kids on her return, another parent is)
Adjusted Gross Income	$93,700	$42,600
Itemized Deductions	$17,200	$5,700
Standard Deduction	<mark>$24,000</mark>	<mark>$12,000</mark>
Taxable Income	$93,700 -24,000 = $69,700	$42,600 -12,000 = $30,600
Tax from Table	$1,905+.12(69,700-19,050) = $7,983	$952.50+.12(30,600-9,525) = $3,481.50
Tax Credits	$0	$426
Tax Amount after Credits	$7,983	$3,481.50-426 = $3,055.50
Federal Taxes Withheld	$14,570	$4,230
Federal Tax Owed or Refund	Refund $14,570 -$7,983 = 6,587	Refund $4,230.00 -$3,055.50 = $1,174.50
Effective Rate (Tax amount after credits ÷ taxable income)	$7,983/69,700 = 11.5%	$3,055.50/30,600 = 10%

2018 Tax Year	Joshua (3 children)	Karalene (no children)
Filing Status	Head of Household	Married Filing Separately
Adjusted Gross Income	$38,200	$125,400
Itemized Deductions	$7,800	$8,500
Standard Deduction	**$18,000**	**$12,000**
Taxable Income	**$38,200** **-18,000** **= $20,200**	**$125,400** **-12,000** **= $113,400**
Tax from Table	**$1360 + .12(20,200-13,600)** **= $2,152**	**$14,089.50+.24(113,400-82,500)** **= $21,505.50**
Tax Credits	$2,049	$0
Tax Amount after Credits	**$2,152-2,049 = $103**	**$21,505.50**
Federal Taxes Withheld	$3,850	$23,490
Federal Tax Owed or Refund	**Refund** **$3,850** **-103** **= $3,747**	**Owe** **$21,505.50** **-$23,490.00** **= $1,984.50**
Effective Rate (Tax amount after credits÷ taxable income)	**$103/20,200 = 0.5%**	**$21,505.50/113,400 = 19%**

Below is a portion of the 2017 tax year tax schedule from the form 1040 booklet.

a. Find the tax amount for a single person with a taxable income of $39,890.

The taxes from the table would be $5,708.

b. Find the tax amount for a married couple filing jointly with a taxable income of $45,350.

The taxes from the table would be $5,874.

c. Find the tax amount for a single dad filing as head of household with a taxable income of $42,102.

The taxes from the table would be $5,651.

2017 Tax Table — *Continued*

If line 43 (taxable income) is—		And you are—				If line 43 (taxable income) is—		And you are—				If line 43 (taxable income) is—		And you are—			
At least	But less than	Single	Married filing jointly *	Married filing sepa-rately	Head of a house-hold	At least	But less than	Single	Married filing jointly *	Married filing sepa-rately	Head of a house-hold	At least	But less than	Single	Married filing jointly *	Married filing sepa-rately	Head of a house-hold
		Your tax is—						Your tax is—						Your tax is—			
39,000						**42,000**						**45,000**					
39,000	39,050	5,495	4,921	5,495	5,186	42,000	42,050	6,245	5,371	6,245	5,636	45,000	45,050	6,995	5,821	6,995	6,086
39,050	39,100	5,508	4,929	5,508	5,194	42,050	42,100	6,258	5,379	6,258	5,644	45,050	45,100	7,008	5,829	7,008	6,094
39,100	39,150	5,520	4,936	5,520	5,201	42,100	42,150	6,270	5,386	6,270	5,651	45,100	45,150	7,020	5,836	7,020	6,101
39,150	39,200	5,533	4,944	5,533	5,209	42,150	42,200	6,283	5,394	6,283	5,659	45,150	45,200	7,033	5,844	7,033	6,109
39,200	39,250	5,545	4,951	5,545	5,216	42,200	42,250	6,295	5,401	6,295	5,666	45,200	45,250	7,045	5,851	7,045	6,116
39,250	39,300	5,558	4,959	5,558	5,224	42,250	42,300	6,308	5,409	6,308	5,674	45,250	45,300	7,058	5,859	7,058	6,124
39,300	39,350	5,570	4,966	5,570	5,231	42,300	42,350	6,320	5,416	6,320	5,681	45,300	45,350	7,070	5,866	7,070	6,131
39,350	39,400	5,583	4,974	5,583	5,239	42,350	42,400	6,333	5,424	6,333	5,689	45,350	45,400	7,083	5,874	7,083	6,139
39,400	39,450	5,595	4,981	5,595	5,246	42,400	42,450	6,345	5,431	6,345	5,696	45,400	45,450	7,095	5,881	7,095	6,146
39,450	39,500	5,608	4,989	5,608	5,254	42,450	42,500	6,358	5,439	6,358	5,704	45,450	45,500	7,108	5,889	7,108	6,154
39,500	39,550	5,620	4,996	5,620	5,261	42,500	42,550	6,370	5,446	6,370	5,711	45,500	45,550	7,120	5,896	7,120	6,161
39,550	39,600	5,633	5,004	5,633	5,269	42,550	42,600	6,383	5,454	6,383	5,719	45,550	45,600	7,133	5,904	7,133	6,169
39,600	39,650	5,645	5,011	5,645	5,276	42,600	42,650	6,395	5,461	6,395	5,726	45,600	45,650	7,145	5,911	7,145	6,176
39,650	39,700	5,658	5,019	5,658	5,284	42,650	42,700	6,408	5,469	6,408	5,734	45,650	45,700	7,158	5,919	7,158	6,184
39,700	39,750	5,670	5,026	5,670	5,291	42,700	42,750	6,420	5,476	6,420	5,741	45,700	45,750	7,170	5,926	7,170	6,191
39,750	39,800	5,683	5,034	5,683	5,299	42,750	42,800	6,433	5,484	6,433	5,749	45,750	45,800	7,183	5,934	7,183	6,199
39,800	39,850	5,695	5,041	5,695	5,306	42,800	42,850	6,445	5,491	6,445	5,756	45,800	45,850	7,195	5,941	7,195	6,206
39,850	39,900	5,708	5,049	5,708	5,314	42,850	42,900	6,458	5,499	6,458	5,764	45,850	45,900	7,208	5,949	7,208	6,214
39,900	39,950	5,720	5,056	5,720	5,321	42,900	42,950	6,470	5,506	6,470	5,771	45,900	45,950	7,220	5,956	7,220	6,221
39,950	40,000	5,733	5,064	5,733	5,329	42,950	43,000	6,483	5,514	6,483	5,779	45,950	46,000	7,233	5,964	7,233	6,229
40,000						**43,000**						**46,000**					
40,000	40,050	5,745	5,071	5,745	5,336	43,000	43,050	6,495	5,521	6,495	5,786	46,000	46,050	7,245	5,971	7,245	6,236

More Practice (if extra time)

1. Use the **2018 tax tables** to answer the questions and show your steps. The tables will be given to you with any test. Write your answers in complete sentences.

  a. Mariana is single and has $11,402 in itemized deductions. What is her standard deduction and should she claim the itemized deductions or the standard deduction?

  The standard deduction is $12,000. Mariana should use the standard deduction because it is larger than her itemized deductions.

  b. Vy has a gross income of $129,500 and he filed as the head of household with 2 kids. He had $6,500 in itemized deductions. Determine his deduction and calculate his taxable income.

  Vy would get a standard deduction of $18,000. To find his taxable income, subtract that from his gross income.

  $129,000 – 18,000 = $110,000. His taxable income is $110,000.

  c. Alex and Jesse are married, filing jointly. Their taxable income is $96,210. Calculate the amount of tax they owe using the appropriate table.

  $8,907+0.22($96,210 - $77,400) = $13,045.20

  They owe $13,045.20 in taxes.

  d. Tim had $8,420 deducted from his paychecks in withholdings. He calculated his taxes owed to be $7,952. Does he get a refund or owe money and what is the amount?

  $8,420 - $7,952 = $468.

  Tim paid more than he owes, so he gets a refund of $468.