

MTH 110
Exam 1
Spring 2018

Be neat and organized. Clearly indicate your answers. 100 points possible.

The following formulas may or may not be useful.

P = loan size r = nominal annual interest rate n = number of payments per year
 t = number of years $i = \frac{r}{n}$ = interest rate per period $m = nt$ = total number of payments

$$PMT = \frac{P \cdot \frac{r}{n}}{\left[1 - \left(1 + \frac{r}{n}\right)^{-nt}\right]} \qquad PMT = \frac{P \cdot i}{[1 - (1 + i)^{-m}]}$$

Interest = (Previous period's unpaid balance) $\cdot i$

Balance reduction = Payment $-$ Interest

New unpaid balance = Old unpaid balance $-$ Balance reduction

0. (4 pts.) Write your name on this exam.

1. (7 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to find the next few numbers.

3 11 19 27 35 _____ _____ _____ _____ 75

2. (7 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to find the next few numbers.

4 7 11 16 22 _____ _____ _____ _____ 67

3. (7 pts.) Express 96.55% as a decimal.

4. (7 pts.) Express $25\frac{1}{2}\%$ as a decimal.

5. (7 pts.) What is 2% of 170?

6. (7 pts.) 231 is 30% of what?

7. (7 pts.) An exercise machine with an original price of \$620 is on sale at 23% off. What is the exercise machine's sale price?

8. (7 pts.) You spend $\frac{3}{7}$ of your money. You spent \$23.52. How much money did you start with?

9. (10 pts.) In this problem, base the taxable income on the greater of a standard deduction or an itemized deduction.

Suppose a taxpayer earned wages of \$92,100, received \$831 in interest from a savings account, and contributed \$2500 to a traditional IRA tax-deferred retirement savings plan. The taxpayer is entitled to a personal exemption of \$3800 and a standard deduction of \$5950. The taxpayer paid interest of \$8075 on a home mortgage, contributed \$740 to charity, and paid \$1670 in state taxes.

(a) Find the gross income.

(b) Find the adjusted gross income.

(c) Find the taxable income.

10. (10 pts.) Use the 2012 marginal tax rates in the accompanying table to compute the tax owed by this couple.

a married couple filing jointly with a taxable income of \$170,000 and a \$6500 tax credit

11. (10 pts.) A loan of \$65,000 is to be amortized with 30 equal quarterly payments. If the interest rate is 8%, compounded quarterly, what is the periodic payment?

12. (10 pts.) A loan of \$140,000, with interest at 6% compounded semiannually, is to be repaid in 10 years by making equal semiannual payments of \$9410.20. Fill in only the first two rows of the amortization schedule, for the first two semiannual payments.

<i>Period</i>	<i>Payment</i>	<i>Interest</i>	<i>Balance reduction</i>	<i>Unpaid balance</i>
				140,000.00
1				
2				

Calculating Income Tax:

1. Determine your adjusted gross income:

$$\text{Adjusted gross income} = \text{Gross income} - \text{Adjustments.}$$

All income for the year, including wages, tips, earnings from investments, and unemployment compensation

Includes payments to tax-deferred savings plans

2. Determine your taxable income:

$$\text{Taxable income} = \text{Adjusted gross income} - (\text{Exemptions} + \text{Deductions}).$$

A fixed amount for yourself (\$3800 in 2012) and the same amount for each dependent

Choose the greater of a standard deduction or an itemized deduction, which includes interest on home mortgages, state income taxes, property taxes, charitable contributions, and medical expenses exceeding 7.5% of adjusted gross income.

3. Determine the income tax:

$$\text{Income tax} = \text{Tax computation} - \text{Tax credits.}$$

Use your taxable income and tax rates for your filing status (single, married, etc.) to determine this amount.

May include up to \$1000 per child, the cost of child care so a parent can work, and adoption credits for qualified expenses.

2012 Marginal Tax Rates, Standard Deductions, and Exemptions for Textbook Homework Problems

	Unmarried, divorced, or legally separated	Married and each partner files a separate tax return	Married and both partners file a single tax return	Unmarried and paying more than half the cost of supporting a child or parent
Tax Rate	Single	Married Filing Separately	Married Filing Jointly	Head of Household
10%	up to \$8700	up to \$8700	up to \$17,400	up to \$12,400
15%	\$8701 to \$35,350	\$8701 to \$35,350	\$17,401 to \$70,700	\$12,401 to \$47,350
25%	\$35,351 to \$85,650	\$35,351 to \$71,350	\$70,701 to \$142,700	\$47,351 to \$122,300
28%	\$85,651 to \$178,650	\$71,351 to \$108,725	\$142,701 to \$217,450	\$122,301 to \$198,050
33%	\$178,651 to \$388,350	\$108,726 to \$194,175	\$217,451 to \$388,350	\$198,051 to \$388,350
35%	more than \$388,350	more than \$194,175	more than \$388,350	more than \$388,350
Standard Deduction	\$5950	\$5950	\$11,900	\$8700
Exemptions (per person)	\$3800	\$3800	\$3800	\$3800