

**MTH 110**  
**Exam 1 Form A**  
**Fall 2025**

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Simple interest formulas

$$I = Prt \quad A = P + I \quad A = P + Prt \quad A = P(1 + rt)$$

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Compound interest formulas

$$A = P \left(1 + \frac{r}{n}\right)^{(nt)} \quad Y = \left(1 + \frac{r}{n}\right)^n - 1$$

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Car loan formulas

$$PMT = \frac{P \left(\frac{r}{n}\right)}{\left[1 - \left(1 + \frac{r}{n}\right)^{-(nt)}\right]} \quad I = PMT * n * t - P$$

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**0.** (5 pts.) If you haven't done so already, do the Excel problem for Exam 1 and submit it on Blackboard. Due Monday 9/22.

**1.** (5 pts.) Identify an apparent pattern in the sequence of numbers. Use this pattern to fill in the blanks with the numbers that complete the sequence. The last term is given so that you can check your work.

3, 8, 14, 21, 29, 38, —, —, —, 84

**2.** (10 pts.) Express the decimal as a percent.

(a) 0.32

(b) 0.002

**3.** (10 pts.) Express the percent as a decimal.

(a) 86%

(b) 650%

4. (10 pts.) An item that normally sells for \$49.60 is on sale at 20% off.

(a) What is the discount amount?

(b) What is the item's sale price?

5. (10 pts.) Suppose your friend earned wages of \$108,900, received \$750 in interest from a savings account, and contributed \$16,500 to a tax-deferred retirement plan. They are entitled to a standard deduction of \$18,800. The interest on their home mortgage was \$9760, they contributed \$7000 to charity, and they paid \$3465 in state taxes.

Find the gross income, the adjusted gross income, and the taxable income. Base the taxable income on the greater of a standard deduction or an itemized deduction.

(a) Gross income

(b) Adjusted gross income

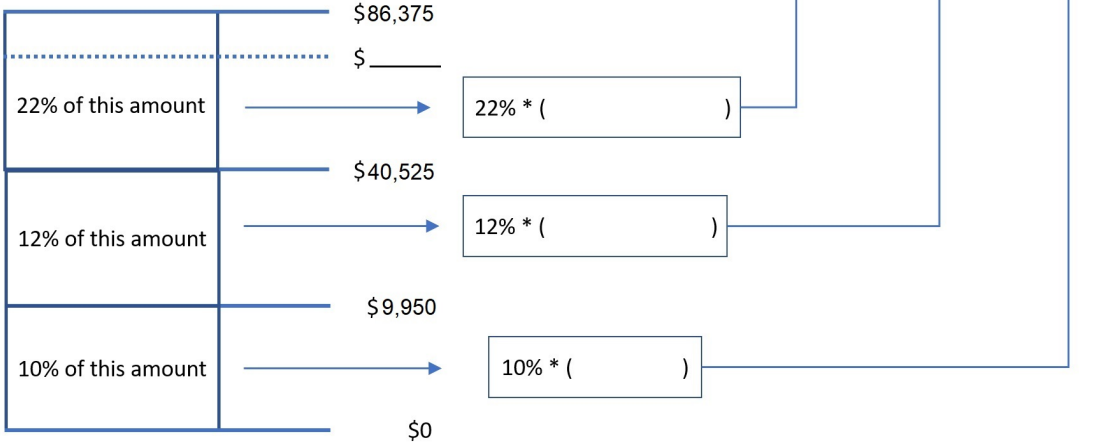
(c) Taxable income

6. (10 pts.) Use the worksheet *8.2 Tax Computation – Filing Status Single – 2021 Tax Rates* to compute the tax owed by the person with the given filing status and taxable income.

Single with a taxable income of \$62,000

The tax on income of \_\_\_\_\_ is calculated as:

**2021 Federal Tax Rate, Single Person**



7. (10 pts.) The principal  $P$  is borrowed at a simple interest rate  $r$  for a period of time  $t$ . Find the simple interest owed for the use of the money. Assume 365 days in a year.

$$P = \$28,000, \quad r = 9.3\%, \quad t = 18 \text{ months}$$

8. (10 pts.) In order to pay for baseball uniforms, a school takes out a simple interest loan for \$39,000 for five months at a rate of 12%.

(a) How much interest must the school pay?

(b) Find the future value of the loan.

9. (10 pts.) The principal represents an amount of money deposited in a savings account subject to compound interest at the given rate.

Principal	Rate	Compounded	Time
\$7500	0.7%	quarterly	8 years

(a) Find how much money there will be in the account after the given number of years.

(b) Find the interest earned.

**10.** (10 pts.) Suppose that you borrow \$38,000 for five years at 3% toward the purchase of a car.

The loan requires monthly payments, and the interest is compounded monthly.

(a) Find the monthly payments.

(b) Find the total interest for the loan.

## 8.2 Tax Definitions and Examples

These aren't exact, legal definitions. There are many exceptions. These are good enough for us.

**Gross income** = all income from whatever source

Examples of gross income: wages, tips, interest from investments, dividends, unemployment compensation, profits from a business, rental income, game-show winnings

**Adjustments** = portions of gross income that aren't taxed

Examples of adjustments: contributions to tax-deferred retirement plans, interest paid on student loans, some self-employment costs

**Adjusted gross income** = **Gross income** – **Adjustments**

**Standard deduction** = a lump-sum amount you can subtract from adjusted gross income

**Itemized deductions** = items listed separately that you can subtract from adjusted gross income *instead of* the standard deduction

Examples of itemized deductions: interest on home mortgages, state income taxes, property taxes, charitable contributions, medical expenses exceeding 7.5% of adjusted gross income

**Choose the *greater* of the standard deduction or itemized deductions**

**Taxable income** = **Adjusted gross income** – **Deductions**

**Tax computation** = an amount computed using your taxable income and tax rates from your filing status (single, married filing jointly, married filing separately, head of household)

**Tax credits** = amounts that reduce income tax owed by the full dollar amount of the credits

Examples of tax credits: credit for adopting a child, credit for buying an electric vehicle

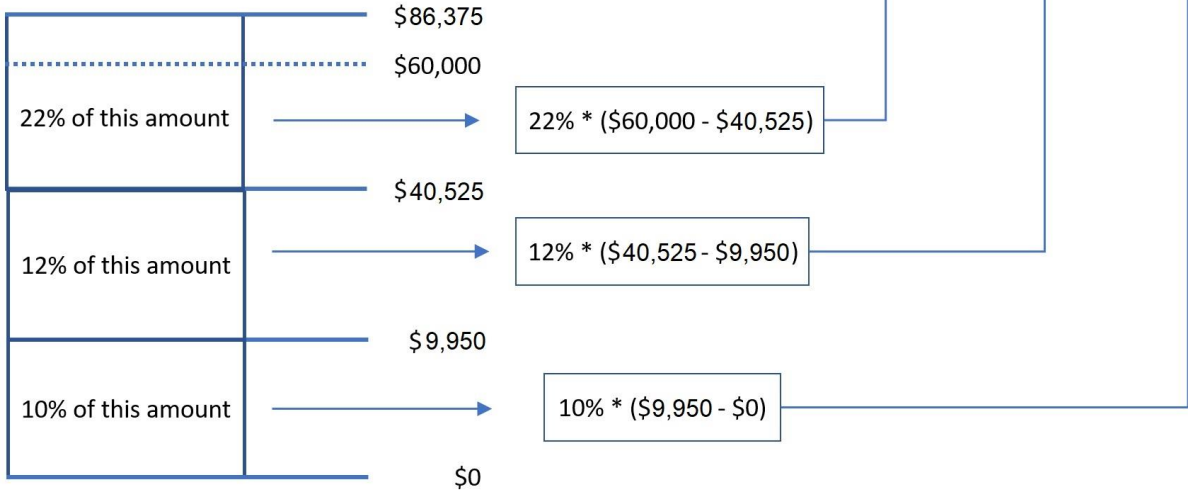
**Income tax** = **Tax computation** – **Tax credits**

## 8.2 Tax Computation - Filing Status Single - 2021 Tax Rates

The tax on income of \$60,000 is calculated as:

### 2021 Federal Tax Rate, Single Person

$$\mathbf{\$8,948.50} = \$4,284.50 + \$3,669.00 + \$995.00$$



The tax on income of \_\_\_\_\_ is calculated as:

### 2021 Federal Tax Rate, Single Person

$$\underline{\hspace{2cm}} = \underline{\hspace{2cm}} + \underline{\hspace{2cm}} + \underline{\hspace{2cm}}$$

