Pre-Calculus w/ Advanced Topics
Tax Brackets Activity

Every year, the IRS adjusts more than 40 tax provisions for inflation. This is done to prevent what is called "bracket creep." This is the phenomenon by which people are pushed into higher income tax brackets or have reduced value from credits or deductions due to inflation, instead of any increase in real income.
The IRS uses the Consumer Price Index (CPI) to calculate the past year's inflation and adjusts income thresholds, deduction amounts, and credit values accordingly.

from: http://taxfoundation.org/article/2016-tax-brackets

In 2016, the federal income tax brackets will be as follows:

2016 Taxable Income Brackets and Rates			
Rate	Single Filers	Married Joint Filers	Head of Household Filers
10%	$0 to $9,275	$0 to $18,550	$0 to $13,250
15%	$9,275 to $37,650	$18,550 to $75,300	$13,250 to $50,400
25%	$37,650 to $91,150	$75,300 to $151,900	$50,400 to $130,150
28%	$91,150 to $190,150	$151,900 to $231,450	$130,150 to $210,800
33%	$190,150 to $413,350	$231,450 to $413,350	$210,800 to $413,350
35%	$413,350 to $415,050	$413,350 to $466,950	$413,350 to $441,000
39.6%	$415,050+	$466,950+	$441,000+
			source: IRS

Each bracket is associated with a marginal tax rate, that is, a rate that only applies to the money earned within that bracket. If a single filer earned $15,000 in the year 2016, dollars 0 to 9275 would be taxed at a 10% rate, while dollars 9,275 to 15,000 would be taxed at a 15% rate.

1. Write a function $f_1(x)$ that takes in x, the total number of dollars a single filer earned in the year 2016 and outputs the amount of total taxes they will if they earn $9,275 or less.

2. Write a function $f_2(x)$ that takes in x, the total number of dollars a single filer earned in the year 2016 and outputs the amount of total taxes they will pay if they earn between $9,275 and $37,650.

A **piecewise-defined function** is a function that is defined differently for different values of x. For example, the absolute value function can be written as a piecewise-defined function as follows:

$$g(x) = |x| = \begin{cases} -x, & x < 0 \\ x, & x \geq 0 \end{cases}$$

Notice the notation for writing a piecewise-defined function. You write the equation for each piece, as well as the domain on which you would use the piece.

3. Write a piece-wise function $f(x)$ that takes in x, the total number of dollars a single filer earned in the year 2016 and outputs the amount of total taxes they will if they earn any amount of money. Hint: You've already written two of the pieces in #1 and #2 of this handout.