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MATH 100

Fall 2022

HW 12: Due 10/31

"I'm proud to pay taxes in the United States; the only thing is, I could be just as proud for half the money."

—Arthur Godfrey

Problem 1. (10pt) Justin is filing his 2022 taxes. Over the past year, he made \$98,553. He is a single filer taking the standard deduction of \$12,950. The tax brackets for the 2022 tax year are found below. Compute Justin's federal income tax. How much will he make after taxes?

Tax Rate	Taxable Income
10%	\$0 – \$10,275
12%	\$10,276 – \$41,775
22%	\$41,776 – \$89,075
24%	\$89,076 – \$170,050
32%	\$170,051 – \$215,950
35%	\$215,951 – \$539,900
37%	\$539,901 or more

Solution. After tax deductions, Justin has $\$98,553 - \$12,950 = \$85,603$ in taxable income. But then we have...

$$\begin{aligned}\text{Tax} &= 0.10(\$10,275 - \$0) + 0.12(\$41,775 - \$10,275) + 0.22(\$85,603 - \$41,775) \\ &= 0.10(\$10,275) + 0.12(\$31,500) + 0.22(\$43,828) \\ &= \$1,027.50 + \$3,780.00 + \$9,642.16 \\ &= \$14,449.70\end{aligned}$$

Therefore, Justin will pay \$14,449.70 in federal income taxes in 2022.

Problem 2. (10pt) If a good that cost \$15 last year now costs \$20, what was the inflation rate from last year to this year? Suppose that this was the true inflation rate. If the CPI last year was \$287.33, what is the CPI this year?

Solution. We have $\frac{\$20}{\$15} \approx 1.3333 = 1 + 0.3333$. Therefore, the inflation rate was 33.33%. But then if the CPI last year was \$287.33, we predict that the CPI this year would be . .

$$\$287.33(1 + 0.3333) = \$287.33(1.3333) \approx \$383.097$$