

1. (10pts) a) 3 is what percent of 7?

$$A = PB$$

$$3 = P \cdot 7$$

$$P = \frac{3}{7} = 0.428571, 42.8571\%$$

- b) 52% of what number is 13?

$$13 = 0.52 \cdot B$$

$$\frac{13}{0.52} = B$$

$$B = 25$$

2. (6pts) You bought a bookshelf stereo system for \$249. If sales tax is 9.75% (like in Tennessee), what is the total cost?

$$\text{tax} = 0.0975 \cdot 249 = 24.28$$

$$\text{total cost} = 249 + 24.28 = 273.28$$

3. (12pts) In 2008, Thomas, a single man, filed a tax return. His total income was \$80,400, he deposited \$5000 into a retirement account, paid \$7,500 in mortgage interest and \$3,250 in property taxes, and donated \$600 to charity. Use the table on page 448 of our book to first determine Thomas' taxable income (don't forget the exemption) and then find the tax on this income.

deductions:

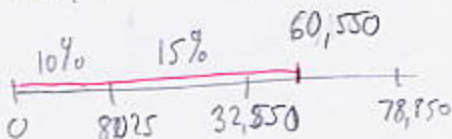
$$\begin{array}{r} 7500 \\ 3250 \\ 600 \\ \hline \end{array}$$

11350, greater than 5450
standard deduction 5450

Taxable income:

$$80,400 - (5,000 + 11,350 + 3,500)$$

$$= 80,400 - 19,850 = 60,550$$



$$\begin{aligned} \text{Tax} &= 0.10 \cdot 8025 \\ &+ 0.15 \cdot (32,550 - 8025) \\ &+ 0.25 \cdot (60,550 - 32,550) \\ &= 0.10 \cdot 8025 + 0.15 \cdot 24,525 + 0.25 \cdot 28,000 \\ &= 802.50 + 3678.75 + 7000 \\ &= 11,481.25 \text{ tax} \end{aligned}$$

4. (12pts) A \$2000 investment in stock of an oil company gained 35% in six months, as oil prices rose. In the next six months the stock lost 30% of its value. How much is it worth at the end of the year-long period? Did the investment make or lose money?

At end of first six months, value is

$$2000 + 0.35 \cdot 2000 = 2000 + 700 = 2700$$

At end of second six months, value is

$$2700 - 0.30 \cdot 2700 = 2700 - 810 = 1890$$

Overall, the investment lost \$110.

5. (10pts) How much money should you deposit in a simple-interest account bearing 3.05% if you would like to have \$2000 in fifteen months? How much of the final \$2000 is from interest?

$$A = P(1 + rt)$$

$$2000 = P(1 + 0.0305 \cdot \frac{15}{12})$$

$$2000 = P \cdot 1.038125 \quad | \div 1.038125$$

$$P = \frac{2000}{1.038125} = 1926.55$$

$$2000 - 1926.55 = 73.45$$

from interest

6. (10pts) A cash-advance service with offices in Murray is offering the following deal: borrow \$150 today and repay us with \$176.47 in two weeks. What interest rate are they charging on this short-term loan?

$$A = P(1 + rt)$$

$$176.47 = 150(1 + r \cdot \frac{2}{52}) \quad | \div 150$$

$$1.17647 = 1 + \frac{r}{26} \quad | -1$$

$$0.17647 = \frac{r}{26} \quad | \cdot 26$$

$$r = 4.588133 \text{ which is } 458.81\% \text{ (!!)}$$