College Algebra — Joysheet 2
MAT 140, Fall 2021 — D. Ivanšić

Name: Soul Ocean

Covers: 8.1–8.3 *Show all your work!*

1. (8pts) a) What is 59 percent of 223?

$A = P \cdot B$

$A = 0.59 \cdot 223$

$= 131.57$

b) 31% of what number is 15?

$A = P \cdot B$

$15 = 0.31 \cdot B$

$B = \frac{15}{0.31} = 48.387097$

2. (6pts) You bought a pair of sneakers for \$99. If sales tax is 6%(like in Kentucky), what is the total cost?

Tax: $0.06 \cdot 99 = 5.94$

Total cost: $99 + 5.94 = 104.94$

3. (13pts) Harry and Meghan, a married couple with three children, are filing a single tax return. They earned \$80,450 in wages and \$815 in interest; they deposited \$8000 into a retirement account; they paid \$6,000 in mortgage interest, \$2,000 in property taxes and \$3000 in state income taxes, and donated \$450 to charity.
a) Find Harry and Meghan's gross income and adjusted gross income.
b) Use the table 8.1 (2016 marginal tax rates, standard deductions and exemptions) on page 507 of our book to first determine Harry and Meghan's taxable income (don't forget the exemptions) and then find the tax on this income.

a) Gross income = $80,450 + 815 = 81,265$

Adj. Gross income = $81,265 - 8000 = 73,265$

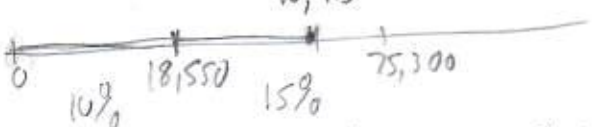
itemized deductions:

6000
2000
3000
450
11,450

standard deductions: 12,600
(married Filing jointly)
↑ use this, since it is greater than itemized deductions

b) taxable income = $73,265 - (12,600 + 5 \cdot 4050)$ ← exemptions
$= 73,265 - 32,850$
$= 40,415$

Tax on 40,415



$0.1 \cdot 18,550 + 0.15\,(40,415 - 18,550)$

$= 1855 + 0.15 \cdot 21,865 = \boxed{5134.75}$

income tax

4. (13pts) In 2018 a flat screen monitor cost \$470. Over the next two years, demand increased, so the price rose 22%. Over the following year, demand dropped, and the price dropped 15% What is the cost of the monitor after three years? Did it increase or decrease compared to cost in 2018, and by how many percent?

Price increase = $470 \cdot 0.22 = 103.40$

Price after increase = $470 + 103.40 = 573.40$

Price decrease = $0.15 \cdot 573.40 = 86.01$

Price after decrease = $573.40 - 86.01 = 487.39$

cost after 3 years.

Overall Price change = $\frac{487.39 - 470}{470} = 0.037$

Price increased 3.7%

OR:

Cost after 3 years =

$470 \cdot 1.22 \cdot 0.85 = 487.39$

$1+0.22$ $1-0.15$

Overall price change =

$1.22 \cdot 0.85 - 1 = 0.037$

5. (10pts) How much money should you deposit in a simple-interest account bearing 4.75% if you would like to have \$7500 in thirty months? How much of the final \$7500 is from interest?

$A = P(1+rt)$

$7500 = P(1 + 0.0475 \cdot \frac{30}{12})$

$7500 = P \cdot 1.11875$

$P = \frac{7500}{1.11875} = 6703.91$

Interest = $7500 - 6703.91 = 796.09$

6. (10pts) Alfred borrowed \$4000 on a credit card and repaid it in four months with \$4280. What percent simple (annual) interest rate was he paying on this loan?

$A = P(1+rt)$

$4280 = 4000\left(1 + r \cdot \frac{4}{12}\right)$ $\mid \div 4000$

$\frac{4280}{4000} = 1 + \frac{r}{3}$

$1.07 = 1 + \frac{r}{3}$ $\mid -1$

$0.07 = \frac{r}{3}$ $\mid \cdot 3$

$0.21 = r$

Interest rate is 21%.