Math 123
Fall 2023
Dr. Lily Yen

Assignment 4
Show all your work

Name: _____

Number: _____

Signature: _____

Score: ___/17

Problem 1: Answer the questions. Write out steps for each. One mark per part except the last part is two marks.

a. Convert the fraction *four and three fifths* into a percent.

$\boxed{460.0\,\%}$

$4\frac{3}{5} = 4.6 = 460\,\%$

b. Find $88\,\%$ of 350.

$\boxed{308}$

$0.88 \times 350 = 308$

c. Brian wants to share 11 popsicles out of a box of 25 with his friends. What percentage of his box of popsicles does he want to share?

$\boxed{44\,\%}$

$\frac{11}{25} = 0.44 = 44\,\%$

d. If Janette finds in her closet $10\,\%$ of her shoes are Hunters rubber boots, and she counts 2 pairs of Hunters, how many pairs of shoes does she have in her closet?

$\boxed{20\text{pairs}}$

If $0.1x = 2$, then $x = \frac{2}{0.1} = 20$

e. David's family attended a concert in the Orpheum in October this year. For the family dinner before Wynton Marsalis's concert, David's father paid \$32 local service tax, which is a $12\,\%$ tax in BC. What was the dollar amount for just their food cost before tip and taxes?

$\boxed{\$266.67}$

If the bill was \$$x$, then the tax was $0.12x = 32$, so he paid $x = 32/0.12$, so $x = \frac{\$32}{0.12} = \$266.67$.

Score: ___/6

Problem 2: Solve for the indicated variable.

a. Solve for n in $m = \frac{P+I}{n}$

If $m = \frac{P+I}{n}$, then $mn = P + I$, so $n = \frac{P+I}{m}$.

b. Solve for x in $(5)^x = 456$. Provide accuracy to two decimal places.

If $(5)^x = 456$, then $\log\left((5)^x\right) = \log(456)$, so $x\log(5) = \log(456)$, so $x = \frac{\log(456)}{\log(5)} \approx 3.80$.

c. Solve for m in $A = P(1 + r/m)^{15}$

If $A = P(1 + r/m)^{15}$, then $A/P = (1 + \frac{r}{m})^{15}$, so $(A/P)^{1/15} = 1 + \frac{r}{m}$, so

$$\frac{r}{m} = (A/P)^{1/15} - 1, \quad \text{so} \quad m = \frac{r}{(A/P)^{1/15} - 1}$$

Score: ___/5

Problem 3: Last March, Janette's grandpa purchased some structured notes upon the recommendation of his financial advisor. The structured notes averaged a $9\,\%$ growth compounded semi-annually and would mature in 8 years. How much would Janette's grandpa expect to have if he purchased a $\$60\,000$ note?

Applying the compound interest formula, we get

$$A = P(1 + 0.09/2)^{2\times 8} = 60\,000(1 + 0.045)^{16} \approx 121\,342.21$$

after 8 years.

Score: /2

Problem 4: Brian's uncle, Ted, purchased a bakery and financed $\$95\,000$ at $\$1137.28$ per month for 10 years. Assuming the add-on interest method, what was the interest rate charged over the loan for 10 years?

Ted paid a total of $10 \times 12 \times \$1137.28 = \$136\,473.6$. Since he borrowed $\$95\,000$, the total interest rate was $(136473.6 - 95000)/95000/10 \approx 4.37\%$.

Score: /2

Problem 5: If *Student Visa* credit card charges $20\,\%$ on unpaid balance, how much would it cost in finance charge to leave $\$1321$ unpaid past the due date for 30 days? Hint: Credit card companies use 365 days a year. For the sake of simplicity, use simple interest.

$$\$1321 \times \frac{0.20}{365} \times 30 \approx \$21.72$$

Score: /2