

Assignment 4

Show all your work

Name: _____
Number: _____
Signature: _____
Score: ____/10

Problem 1: Answer each question to two decimal place accuracy when appropriate. Write out steps for each.

- a. Convert the fraction *three fifths* into a percent.

$$\frac{3}{5} = 60\%$$

60%

- b. Find 130% of 90.

$$1.3 \times 90 = 117$$

117

- c. What fraction of 250 is 70? Simplify to lowest terms.

$$\frac{70}{250} = \frac{7}{25}$$

7/25

- d. 9 is 3% of what number?

$$\text{If } 0.03x = 9, \text{ then } x = \frac{9}{0.03} = 300$$

300

- e. When you pay a 45-dollar monthly cellphone/data package, how much in taxes do you need to pay? Hint: We have a 5% GST and 7% PST.

$$12\% \text{ of } \$45 \text{ is } 0.12 \times \$45 = \$5.40,$$

\$5.40

- f. The following is a quote from *Entertainment Software Association of Canada*.

In 2021, the global industry will generate over US\$176 billion in revenue, a 21% increase from 2019. The Canadian video game industry has followed a similar trajectory over the same period. In 2021, the industry generated an estimated US\$3.4 billion in revenue, having grown by 20% since 2019.

What was the revenue in the Canadian video game industry from 2019?

US\$ 2.83 billion

Let x in dollars represent the revenue in Canadian video game industry from 2019.

$$\text{Then } 3.4 \times 10^9 = 1.2 \times x \text{ so } x = 3.4 \times 10^9 / 1.2 \approx 2.83 \times 10^9$$

Score: /6

Problem 2: David needs to decide which of the following two investment options is better: an annual interest rate of 4.9% compounded daily or an annual interest rate of 5.1% compounded semi-annually. Show all calculation which leads to your conclusion.

With the first investment, after one year you would have multiplied the principal by $(1 + \frac{0.049}{365})^{365} = 1.0502$, so the effective rate is 5.02%.

With the second investment, you get $(1 + \frac{0.051}{2})^2 = 1.0517$, so the effective rate is 5.17%. Therefore the second option is better.

Score: /2

Problem 3: Brian's grandmother invests \$40 000 at a rate of 4.75% compounded quarterly. Find the time in years that it takes her investment to triple.

If $40\,000(1 + \frac{0.0475}{4})^{4t} = 3 \times 40\,000$, for t in years, then $(1.011875)^{4t} = 3$. Taking log on both sides, then dividing by 4 yields that $t \approx 23.27$ years.

Score: /2