

# Quiz 3

Show all your work

Name: \_\_\_\_\_  
Number: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Score: \_\_\_\_/22

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

- a. Convert the fraction  $7/8$  into a percent.

$$\frac{7}{8} = 0.8750 = 87.50\%$$

87.50%

- b. Find 12.25% of 160.

$$0.1225 \times 160 = 19.60$$

19.60

- c. What percent of 80 is 12?

$$\frac{12}{80} = 0.1500 = 15.00\%$$

15.00%

- d. 77 is 22% of what number?

$$\text{If } 0.22x = 77, \text{ then } x = \frac{77}{0.22} = 350.00$$

350.00

- e. When you buy a 100-dollar coat, how much in taxes do you need to pay in BC? Hint:

We have a 5% GST and 7% PST.

$$12\% \text{ of } \$100 \text{ is } 0.12 \times 100 = 12.$$

\$12

Score: /5

**Problem 2:** Solve for the indicated variable.

- a. Solve for  $r$  in  $A = Prt$

$$r = \frac{A}{Pt}$$

- b. Solve for  $x$  in  $(1.05)^x = 2$

$$\text{If } (1.05)^x = 2, \text{ then } \log((1.05)^x) = \log(2), \text{ so } x \log(1.05) = \log(2), \text{ so}$$
$$x = \frac{\log(2)}{\log(1.05)} \approx 14.21$$

- c. Solve for  $m$  in  $A = P(1 + r/m)^n$

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

$$m = \frac{r}{(A/P)^{1/n} - 1}$$

Score: /7

**Problem 3:** Suppose you plan to save \$3000 for a backpacking tour around Europe in two years. Your bank offers a guaranteed investment certificate (GIC) at 2% annual interest computed using simple interest. How much must you put in this GIC to have the necessary money in two years?

If you invest  $P$  dollars, you will earn  $2 \times 0.02P = 0.04P$  in the two years, so you will have  $P + 0.04P = 1.04P$ . Therefore,  $1.04P = \$3000$ , so  $P = \frac{\$3000}{1.04} = \$2884.62$ .

Score: /3

**Problem 4:** When Sue's rich American uncle died in January, 2000, he left \$50 000 in a trust for Sue's university education. Assume that the trust earns an annual interest rate of 4.8% compounded quarterly. How much would be in the trust in the end of September, 2017?

After  $17 \times 4 + 3 = 71$  quarters you will have

$$\$50\,000 \left(1 + \frac{4.8\%}{4}\right)^{71} = \$50\,000 (1 + 1.2\%)^{71} = \$50\,000 (1.012)^{71} = \$116\,623.59$$

Score: /3

**Problem 5:** A new iPhone costs \$1000. Suppose you take out an add-on loan for 3 years at an annual interest rate of 21%, what will be your monthly payments? Also find the finance charges.

The simple interest on \$1000 at 21% for 3 years is  $\$1000 \times 0.21 \times 3 = \$630.00$ , so the monthly payments are

$$\frac{\$1000 + \$630.00}{3 \times 12} = \frac{\$1630.00}{36} = \$45.28$$

Score: /4