

Name: _____ () Class: _____ Date: _____

Lesson Worksheet 7.3B

Objective: To consolidate the knowledge acquired in this section.

1. A sum of \$9000 is deposited at an interest rate of 3.7% p.a. for 10 years, compounded quarterly. Find the interest. (Give the answer correct to the nearest \$0.01.)

$$\text{Amount} = \$(\underline{9000}) \times \left(1 + \frac{3.7\%}{4}\right)^{(40)} = \$\underline{13\,007.47}$$

$$\text{Interest} = \$(\underline{13\,007.47} - \underline{9000}) = \$\underline{4007.47}, \text{ corr. to the nearest } \$0.01$$

2. Donald deposits a sum of money in a bank and the interest rate is 8% p.a., compounded half-yearly. Donald will receive an amount of \$32 800 two years later. Find the sum of money deposited by Donald, correct to the nearest thousand dollars.

Let \$P be the sum of money deposited.

$$P \times \left(1 + \frac{8\%}{2}\right)^{(4)} = \underline{32\,800}$$

$$P(1.04)^4 = 32\,800$$

$$P = \frac{32800}{1.04^4}$$

$$P = \underline{28\,000}, \text{ corr. the nearest thousand}$$

∴ Donald deposits \$ 28 000.

- *3. Ryan borrows \$100 000 from a bank. The interest is compounded monthly. After two months, he will have to pay interest of \$3360. Find the annual interest rate, correct to the nearest integer.

Let $r\%$ be the annual interest rate.

$$(\underline{100\,000}) \times \left(1 + \frac{r\%}{12}\right)^{(2)} - (\underline{100\,000}) = (\underline{3360})$$

$$r\% = 20\%, \text{ cor. to the nearest integer}$$

∴ The annual interest rate is 20%.

deposit(本金) interest rate(利率) compounded interest(複利息) amount(本利和)

4. Sheryn joins a 5-years saving plan offered by a bank. At the beginning, Sheryn has to invest \$60 000. In the first two years, the bank offers an interest rate of 3% p.a., compounded quarterly. After that, the bank will change the interest rate to 4% p.a., compounded quarterly. Find the interest earned by Sheryn from the plan. (Give the answer correct to the nearest dollar.)

$$\text{Amount after 2 years} = \$ \left(\underline{60\,000} \right) \times \left(1 + \frac{3\%}{4} \right)^{(8)} = \$ \underline{63\,695}$$

$$\text{Amount after 5 years} = \$ \left(\underline{63\,695.93} \right) \times \left(1 + \frac{4\%}{4} \right)^{(12)} = \$ \underline{71\,774}$$

$$\text{Interest earned by Sheryn} = \$ \left(\underline{71\,774} - \underline{60\,000} \right) = \$ \underline{11\,774}, \text{ corr. to the nearest dollar}$$

5. Mrs Lai wants to deposit \$300 000 in a bank for 8 years. Bank A offers an interest rate of 4.5% p.a., compounded quarterly. Bank B offers an interest rate of 4.8% p.a., compounded half-yearly. Which bank should she choose so as to earn more interest? Explain your answer.

For bank A:

$$\text{Amount} = \$ \left(\underline{300\,000} \right) \times \left(1 + \frac{4.5\%}{4} \right)^{(32)} = \$ \underline{429\,135}, \text{ corr. to the nearest dollar}$$

For bank B:

$$\text{Amount} = \$ \left(\underline{300\,000} \right) \times \left(1 + \frac{4.8\%}{2} \right)^{(16)} = \$ \underline{438\,450}, \text{ corr. to the nearest dollar}$$

∴ Mrs Lai should choose bank B.

- *6. Edward opens a new bank account and deposits \$10 000 at the beginning of each year from 2012 to 2014. The interest rate is 3.6% p.a., compounded half-yearly. Find the amount in Edward's account at the beginning of 2016. (Give the answer correct to the nearest hundred dollars.)

Amount

$$= \$ \left[10\,000 \times \left(1 + \frac{3.6\%}{2} \right)^{(8)} + 10\,000 \times \left(1 + \frac{3.6\%}{2} \right)^{(6)} + 10\,000 \times \left(1 + \frac{3.6\%}{2} \right)^{(4)} \right]$$

$$= \$ (10\,000 \times 1.018^8 + 10\,000 \times 1.018^6 + 10\,000 \times 1.018^4)$$

$$= \underline{\underline{\$33\,400}}, \text{ cor. to the nearest hundred dollars}$$