



**GRADE 11 ESSENTIAL
UNIT B INTEREST AND CREDIT
INTEREST EXAMPLES - SIMPLE AND COMPOUND**

Name: _____

Date: _____

1. An investment project pays simple interest at a rate of **7.5** percent per annum. If a couple invests **\$1900** in this project, how much interest will they earn if they invest for three years?

$$\begin{aligned} i &= p \cdot r \cdot t \\ i &= (1900)(0.075)(3) \\ i &= \$427.50 \end{aligned}$$

2. How much interest is earned on an investment which pays simple interest at a rate of $6\frac{1}{4}$ percent annually if \$2500 is invested for nine months?

$$\begin{aligned} i &= p \cdot r \cdot t \\ i &= (2500)(0.0625)(0.75) \\ i &= \$117.19 \end{aligned}$$

3. A **\$5000** deposit in a savings account earns interest of **\$68.75 in three months**. A three-month certificate account pays interest at a rate of **6.2** percent a year calculated every **three months**.

- a. How much interest would be earned on the three-month certificate in three months?

$$\begin{aligned} i &= p \cdot r \cdot t \\ i &= (5000)(0.062)(0.25) \\ i &= \$77.50 \end{aligned}$$

- b. How much more interest is earned in three months by investing in the certificate rather than the savings account?

$$\$77.50 - \$68.75 = \$8.75$$

4. A credit union offers a six month term deposit account that pays interest at a rate of **7.2 percent** a year. You plan to deposit **\$6000** in this account for six months and then reinvest the principal and interest for another six months at the same rate. How much interest will you earn in a year?

<p>For the 1st six months:</p> $\begin{aligned} i &= p \cdot r \cdot t \\ i &= (6000)(0.072)(0.5) \\ i &= \$216.00 \end{aligned}$	<p>For the 2nd six months:</p> $\begin{aligned} i &= p \cdot r \cdot t \\ i &= (\$216)(0.072)(0.5) \\ i &= \$223.78 \end{aligned}$
<p>Total Interest Earned in 1 year: \$216.00 + \$223.78 = \$439.78</p>	



5. A bank offers **7.2 percent** interest compounded **semi-annually** on an investment option. You invest **\$6000.00** in this option for a term of **one year**.

a. How much **interest** will you earn on the investment after one year??

$$A = P * \left(1 + \frac{r}{s}\right)^{n*s}$$

$$A = 6000 * \left(1 + \frac{0.072}{2}\right)^{1*2} = \text{\$6439.78. So the interest earned is } \text{\$439.78}$$

b. If you compare the interest earned in this investment with the interest earned on the investment in Question 4, what do you notice?

They are the same!. Compounded interest amounts are just like simple interest and principal which is continually re-invested.

6. How much money would have to be invested now in order to amount to **\$6000** in three years if invested at **5 ¾ percent** compounded monthly?

$$6000 = P * \left(1 + \frac{0.0575}{12}\right)^{(3)(12)} = P * 1.187782394$$

$$P = \text{\$6000} / 1.187782394$$

$$P = \text{\$5051.43}$$

7. How long will it take **\$4500** to double if invested at **8 ½ percent** compounded annually?

You will need to use an EXCEL spreadsheet or your TI 83 to calculate this.

If you use the TI 83 (as done in the 'Non-Linear Functions' Unit)

It will take about 8.5 years for the investment to double, but since the interest for the final year isn't paid if you withdraw it before the end of the final year, you need to keep it in the bank a full 9 years, in which case it will actually be worth \$9377.35

Using an EXCEL spreadsheet or the TI 83 Tables you will get a table similar to this:

Years	Begin Value	Interest Earned	End Value
1	\$4,500.00	\$ 382.50	\$4,882.50
2	\$4,882.50	\$ 415.01	\$5,297.51
3	\$5,297.51	\$ 450.29	\$5,747.80
4	\$5,747.80	\$ 488.56	\$6,236.36
5	\$6,236.36	\$ 530.09	\$6,766.45
6	\$6,766.45	\$ 575.15	\$7,341.60
7	\$7,341.60	\$ 624.04	\$7,965.64
8	\$7,965.64	\$ 677.08	\$8,642.72
9	\$8,642.72	\$ 734.63	\$9,377.35
10	\$9,377.35	\$ 797.07	\$10,174.42