**F.3 Mathematics – Supplementary Worksheet for NCM 3A Chapter 3**

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Class: 3\_\_\_\_\_\_ ( )**

**Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Level 1**

1. $30 000 is deposited in a bank at an interest rate of 6% p.a. compounded quarterly. Find the amount and interest after 2.5 years. (*Give the answer correct to the nearest dollar.*)

(10 marks)

2. John deposits $200 000 in a bank and receives a compounded interest of $28 980 in 2 years. The amount received is then deposited in another bank at the same interest rate, but interest is compounded monthly. What will be the total amount received 2 more years later? (*Give the answer correct to the nearest dollar.*)

(14 marks)

3. A certain kind of bacteria increase their number at a constant rate of 50% every   
4 minutes. If there are 20 bacteria initially, how many bacteria will there be after an hour? (*Give the answer correct to the nearest integer.*)

(8 marks)

4. In the past 3 years, the price of a flat was increased by 5% each year. If the present price of the flat is $2 083 725, what is the actual increase in the price of flat over these 3 years?

(12 marks)

5. The price of a mobile phone was $2 200 in 2001. Its value then depreciated by 15% each year. Find

(a) the value of the mobile phone in 2004 correct to the nearest dollar,

(b) the decrease and the percentage decrease in the value of the mobile phone from 2001 to 2004. (*Give the answer correct to 3 significant figures if necessary.*)

(12 marks)

6. Frank bought a MP3 player at $1 500 in 2002. It is estimated that its value will decrease to $1 125 after one year.

(a) Find the decay factor.

(b) Frank will give Mary the MP3 player when the value of the player is less than one third of its original value. Will Mary receive the player in 2006?

(12 marks)

7. There were 54 students in a choral in the last school year, in which 24 were boys and 30 were girls. This school year the number of boys increases by 25% while the number of girls decreases by 10%. Find the percentage change in the number of students in the choral. (*Give the answer correct to 3 significant figures.*)

(10 marks)

8. A family consumed 28 units of electricity last month and the charge for electricity was $12 per unit. This month the charge for electricity is increased by 5% and the family reduces the consumption of electricity by 8%. Find

(a) the difference in the expenditure on electricity between these two months,

(b) the percentage change in the expenditure on electricity over these two months.

(12 marks)

9. James paid $1 500 for the quarterly rates of his flat last year. This year he moves to a new flat of which rateable value is $110 000. What is the percentage change in the quarterly rates payable over these two years? Suppose the rates percentage charge is 5% each year. (*Give the answer correct to 3 significant figures.*)

(10 marks)

**Level 2**

1. Patrick wants to deposit $250 000 in a bank for 3 years. Bank *A* offers an interest rate of 5.5% p.a. compounded half-yearly while bank *B* offers an interest rate of 5.4% p.a. compounded monthly. If Patrick wants to earn more interest, which bank should he deposit his money?

(14 marks)

2. Ivan invests a sum of money at 6% p.a. simple interest for 3 years. Victor deposits the same amount of money in a bank for the same period of time at an interest rate of 5%, but the interest is compounded yearly. The compounded interest received by Victor is $22 375 less than the simple interest received by Ivan.

(a) What is the simple interest received by Ivan?

(b) What is the compound interest received by Victor?

(14 marks)

3. Thomas weighed 60 kg when he was 21 years old. His weight then increased steadily at a rate of 2.5% each year until he was 25 years old.

(a) Find his weight when he was 25 years old.

(b) Find the increase and the percentage increase in his weight during these   
4 years. (*Give the answers correct to 3 significant figures.*)

(12 marks)

4. The population of a city was 7 000 000 in 2000. In 2002, the population is 7 070 175.

(a) Find the growth factor.

(b) If the growth factor remains unchanged, find the population in 2006. (*Give the answer correct to the nearest hundred.*)

(12 marks)

5. The present value of a car is $123 000. Its value was $150 000 one year ago.

(a) Find the percentage decrease in its value.

(b) If the value of car decrease each year at the same percentage in (a), find the value of car

(i) after 4 years,

(ii) 3 years ago.

(*Give the answers correct to the nearest dollar.*)

(14 marks)

6. The value of a flat dropped by 15% during the first half of 2005. If the percentage change in the value of the flat over the whole year is +2%, what is the percentage change during the second half of the year?

(10 marks)

7. The cost of making a wooden bed is calculated as follows:

Wood ……………. $1 000

Paint ……………. $*a*

Labour ……………. $950

Now, the costs of wood and labour increase by 14% and 8% respectively, that of paint decreases by 5%.

(a) If the new cost of making a wooden bed is $2 394, find the value of *a*.

(b) What is the percentage increase in the cost of making a wooden bed?

(*Give the answers correct to 3 significant figures.*)

(14 marks)

8. Johnny has to pay $7 494 of salaries tax. Find his net chargeable income.

Suppose the salaries tax rates are as follows.

Net chargeable income Rate

On the first $40 000 2%

On the next $40 000 7%

On the next $40 000 12%

Remainder 17%

(10 marks)