UNIVERSITY OF CAPE TOWN

DEPARTMENT OF MATHEMATICS AND APPLIED MATHEMATICS

MAM1010F **TUTORIAL 1**

- Assume 1 year = 365 days.
- Round the answers off to two decimal places.

1. The total price for x exam pads is p rand. What is the total price for y exam pads?

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2. A shop offers 3 items for the price of 2 ("buy 2, get 1 free").

2.1. What is the percent reduction in the price?

2.2. Does the percent reduction in the price depend on the price of the item?

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3. What is the percent change in price if a t-shirt for R155 in a shop is sold for

3.1. R120

3.2. R185?

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4. Given the formulae:

a) $FV = PV(1 + rt)$ b) $FV = PV(1 + i)^n$

c) $FV = PV(1 - rt)$ d) $FV = PV(1 - i)^n$.

In each one of them make the following parameter the subject of the formula:

4.1. PV 4.2. $r \ or \ i$ 4.3. $t \ or \ n$

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5. Find the **total interest payment** on each of these loans:

5.1. R5 000 at 6% simple interest for 9 months

5.2. R10 000 at 7,5% p.a. compounded semi- annually for 3 years

5.3. R3 000 at 9% simple interest for 58 days

5.4. R2 000 at 7,5% simple interest; loan made on April 8 and due July 12.

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6. Find the present value of each future amount:

6.1. R16 000 for 9 months; money earns 6% simple interest

6.2. R29 764 for 310 days; money earns 7,2% simple interest

6.3. R20 000 for 5 years; money earns 6,5% p.a. compounded yearly

6.4. R35 000 for 10 years; money earns 5,6% p.a. compounded quarterly.

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7. Exactly 5 years ago Mpume bought a new car for R145 000. The current book value of this car is R72 500. If the car depreciates by a fixed annual rate according to the

reducing balance method, calculate the rate of depreciation.

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8. Samuel took out a home loan for R500 000 at an interest rate of 12% per annum, compounded monthly. He plans to repay this loan over 20 years and his first payment is made one month after the loan is granted.

8.1. Calculate the value of Samuel's monthly instalment.

8.2. Melissa took out a loan for the same amount and at the same interest rate as Samuel. Melissa decided to pay R6 000 at the end of every month. Calculate how many months it took for Melissa to settle the loan.

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9. Convert an interest rate of 10% per annum, compounded monthly, to an annual interest rate, compounded semi-annually.

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10. Gavin purchases a house for R1 200 000. He pays a deposit of 10% of the value of the house. The bank grants him a loan for the outstanding amount, at an interest rate of 8,4% per annum compounded monthly, payable over a period of 20 years.

10.1. Calculate the deposit Gavin pays on the house.

10.2. Calculate Gavin's monthly repayments.

10.3. Calculate the total amount Gavin would have paid for the house at the end of 20 years.

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11. For two years, equipment worth R20 000, depreciates by 20% per annum according to the reducing-balance method. Each year thereafter, the annual depreciation is 2% less than that of the previous year. Determine the depreciated value of the equipment after 4 years.
