BUS 418
Preliminary Mathematics/Statistics/Accounting Quiz

NOTE: This quiz is only for information purposes and will NOT be used as part of the examination component. However, failure to make a good faith effort in answering the questions may affect the participation component of the assessment.

Be sure to provide the following information on your answer sheet:

a) Your name; b) The course which was taken to satisfy the mathematical, statistical and accounting prerequisite for this course; c) Indicate the school which you previously attended. If you are a SFU student indicate the instructor(s) who taught your math/stat. prerequisite course(s).

1) Evaluate by providing a numerical solution or simplify the expression where possible, otherwise expand the summation or formula listing all relevant terms:

$$a)\ \sum_{t=0}^{10} t \qquad b)\ \ln\{\exp[a]\} = \log_e\{e^a\}$$

$$c)\ \sum_{i=1}^{3} \sigma_i^2 X_i^2 + 2\sum_{i<j} X_i X_j \sigma_{ij} \qquad d)\ \sum_{j=1}^{3}\sum_{k=1}^{3} X_j X_k \sigma_{j,k}$$

$$e)\ \exp[a]/\exp[bx] = e^a / e^{bx} \qquad f)\ (x+y)^3$$

$$g)\ \ln(1+x) \text{ for } x \text{ small } (\text{How small is small?})$$

2) Differentiate the function y with respect to the variable x, i.e., evaluate dy/dx:

$$a)\ y = \frac{1}{(1+x)^n} \qquad b)\ y = \sum_{t=1}^{T} \frac{1}{(1+x)^t}$$

$$c)\ y = \ln[x] \qquad d)\ y = \exp[ax] = e^{ax}$$

3) Totally differentiate y where x and z are variables, and all other letters are parameters:

$$a)\ y = ax^3+bz^4 \qquad b)\ y = x^a z^b \qquad c)\ y = (a+bx)/(c+dz+ez^2)$$

4) Provide definitions (mathematical expressions or equations where possible) for the following terms:
a) sample mean (average) b) sample variance c) sample covariance d) Taylor Series Expansion
e) capital asset pricing model f) security market line
g) bond duration h) bond convexity

5) Simplify the following expressions by re-expressing the series as a ratio:

$$a)\ 1 + x + x^2 + x^3 + x^4 + \ldots\ldots \text{ for } |x| < 1 \qquad b)\ \sum_{t=1}^{T} \frac{1}{(1+r)^t}$$