Maths for Economics

Pre-course knowledge assessment

25. June 2015

Welcome to Maths for Economics. Before we get started, I need your help to understand the background that you already have. This is not a test, and you do not need to even write your name on your paper. Please simply do your best to answer each question so that I can figure out how to use our time together as productively as possible.

Part 1: Mathematical notation

What do each of the following symbols and mathematical expressions mean? $0.2\overline{34}$, the integers ($\mathbb{Z}$), the real numbers ($\mathbb{R}$), the rational numbers ($\mathbb{Q}$), (0,3], $\begin{bmatrix} 1 & 2 \\ 5 & 3 \end{bmatrix}$, $(f \circ g)(x)$, $P(X \cap Y)$, $\{1,2,3\}$, $\frac{dy}{dx}$, $\sum 2i$.

Part 2: Arithmetic

Can you work out the value of the following expressions, or simplify how they are written?

a) $\frac{3}{9}$

b) 0.56999 to the nearest 1/1000th.

c) 4 divided by ½

d) $\sqrt{49}$

e) Log 1

f) Log_{10} 4 + 2 Log_{10} 5

g) e^0

h) 23×11

i) 3^3

j) 1.1×2.3

k) $|3 - 4| + 2$

l) $11 - 3 \times 4$

Part 3: Algebra and functions

a) Expand (x-2)(x+3)

b) What value of x satisfies the equation 32=9x+5?

c) What value of x satisfies the equation $x^2 - 4x = 1$?

d) What values of x and y satisfy the equations 2x+3y=12 and x=y+1?

e) If $f(x) = x^2$ and $g(x) = x + 2$, what is $(f + g)(2)$? $(fg)(2)$? $(f \circ g)(2)$?

Part 4: Probability

a) Is it more likely to get heads-tails-heads-heads-tails or heads-heads-heads-tails-tails when flipping a coin?

b) Each year there is a 10% chance that a company will go bankrupt. What is the probability that it will go bankrupt sometime in the next two years?

c) 1% of a population has AIDS. A test for AIDS gives a positive result for a negative patient 1% of the time, and a negative result for a positive patient 1% of the time. How likely is it that a person who tests positive actually has AIDS?

Part 5: Problem solving

Can you work out the answer to the following questions?

a) $100 is put in a bank account with a 3% annual interest rate. How much will be in the bank account in one year if nothing is ever taken out?

b) How about in 2 years?

c) 32 is 40% of what number?

d) Rice is sold in 10kg bags labeled "25% more free", for $1/kg. How much per kilogram does a normal-size bag cost?

Part 6: Requests

Above all else, I am here to help you with whatever mathematical topics you would like to learn or review. Please describe below any topics you wish to learn about, terminology or notation you want to learn, questions you would like to be able to answer, or anything else along those lines.

I will ask you this question at least once more during the class so think about questions you might have over the next few days.