MATH 110-001 QUIZ 2
October 6, 2017
Time: 15 minutes

Show all your work. No calculators, no books/notes are allowed.

Name (please print): ―――――――――――――――――――――――――

Student number: ―――――――――――――――――――――――――

1. Find the following limits, if it exists

    a) $\lim\limits_{x \to -2} \dfrac{e^x}{(x+2)^{10}}$

    b) $\lim\limits_{h \to 0} \dfrac{(3+h)^{-1} - 3^{-1}}{h}$

2. The position of a snowboarder sliding down a slope can be described by the function

$$f(t) = -2t^2 + 3$$

find the *instantaneous* velocity of the snowboarder at t=1.

Hint: the *average* velocity of the snowboarder between $t = a$ and $t = a+h$ is $v_{avg} = \frac{f(a+h)-f(a)}{h}$

Bonus: Is there a number b such that

$$\lim_{x \to -2} \frac{3x^2 + bx + b + 3}{x^2 + x - 2}$$

exists? If so, find the value of b and the value of the limit