**Math 161 Written HW B**

Due:

1. Compute the following limit:



. Suppose that *f* and *g* are differentiable functions satisfying:

f(3) = -2, g(3) = -4, f ′(3) = 3, and g′(3) = -1.

1. *[6 pts]* Let H(x) = (f(x) + 2g(x) + 1)(f(x) – g(x) – 4). Compute H′(3)

(Hint: Use short cuts here.)

*Solution: Using the product rule:*

*H′(x) = (f(x) + 2g(x) + 1) d/dx(f(x) – g(x) – 4) + (f(x) – g(x) – 4) d/dx(f(x) + 2g(x) + 1) =*

*(f(x) + 2g(x) + 1) (f ′(x) – g ′(x)) + (f(x) – g(x) – 4)(f ′(x) + 2g ′(x) ).*

*Thus H′(3) =*

*(f(3) + 2g(3) + 1) (f ′(3) – g ′(3)) + (f(3) – g(3) – 4)(f ′(3) + 2g ′(3))*

*= (-2 – 8 + 1) (3 – (-1)) + (-2 – (-4) – 4)(3 + 2(-1) ) = (-9)(4) + (-2)(1) =* ***-38***

 *(b) [6 pts]* Let  Compute M ′(3)

*Solution: Using the quotient rule:*



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 *(b) [6 pts]* Let  Compute M ′(3)

*Solution: Using the quotient rule:*



. Suppose that *f* and *g* are differentiable functions satisfying:

f(3) = -1, g(3) = -4, f ′(3) = 5, and g′(3) = -1.

**EC** 2. (*Apostol, Calculus*) Evaluate the following limit.

(Calculator solutions will earn no credit.)



*Solution:*

*Solution: Rationalizing the numerator,*





*The more you know, the less sure you are.*

**-** [Voltaire](http://plato.stanford.edu/entries/voltaire/)