

GROUP WORK 2, SECTION 3.2

Sparse Data

Assume that $f(x)$ and $g(x)$ are differentiable functions about which we know very little. In fact, assume that all we know about these functions is the following table of data:

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
-2	3	1	-5	8
-1	-9	7	4	1
0	5	9	9	-3
1	3	-3	2	6
2	-5	3	8	?

This isn't a lot of information. For example, we can't compute $f'(3)$ with any degree of accuracy. But we are still able to figure some things out, using the rules of differentiation.

1. Let $h(x) = e^x f(x)$. What is $h'(0)$?

2. Let $j(x) = -4f(x)g(x)$. What is $j'(1)$?

3. Let $k(x) = \frac{xf(x)}{g(x)}$. What is $k'(-2)$?

4. Let $l(x) = x^3g(x)$. If $l'(2) = -48$, what is $g'(2)$?

5. Let $m(x) = \frac{1}{f(x)}$. What is $m'(1)$?