

PLEASE NOTE that the second exam will cover all material from Chapters 2 and 3 (specifically: Sections 2.1, 2.2, 3.1, 3.2, 3.3, 3.5, 3.6, and 3.7), and the corresponding tutorials.

There will NO be any programming questions on the exam. You certainly may want to use your calculator for some computations, though.

1. Give the best possible estimate for $g'(1)$ that can be obtained from the following table. Please explain why you think this estimate is best.

x	g(x)
0.98	0.8647
.99	0.9312
1	1.0000
1.01	1.0712
1.02	1.1449

2. Let

$$f(x) = 3x^2 + x.$$

- (a) Find the slope of the tangent line to $f(x)$ at the point $x = 1$.

- (b) Write the equation of the tangent line to $f(x)$ at the point $x = 1$.

3. For each of the following functions $h(x)$, (i) find functions f and g such that $h(x) = f(g(x))$;
(ii) find $h'(x)$.

(a) $h(x) = \frac{1}{x+2}$

(b) $h(x) = \sqrt[3]{x^2 - 3}$

(c) $h(x) = 2^{x+\cos(x)}$

(d) $h(x) = 5 + \tan(x^4 + 3x - 1)$

4. Let

$$f(x, y) = \sqrt{\sqrt{x} - y}.$$

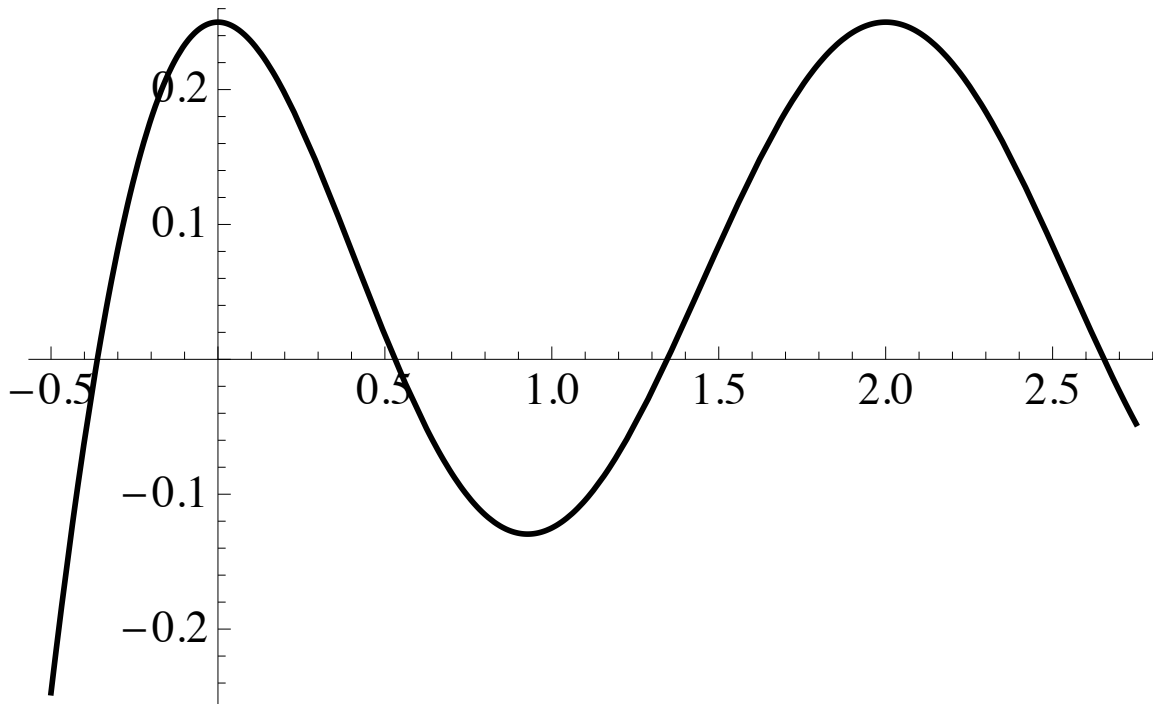
(a) Find $f_x(x, y)$.

(b) Find $f_y(x, y)$.

(c) Use the full microscope equation to estimate

$$\sqrt{\sqrt{4.1} - 1.05}.$$

5. Consider the function $f(x)$ sketched below.



On the axes below, sketch the graph of $f'(x)$.

