Math 131 - Quiz 5

September 28, 2022

Name _____

Score _____

Show all work to receive full credit. Supply explanations when necessary. This quiz is due October3.

1. (6 points) The following table gives information about the functions f and g and their derivatives at selected points.

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

(a) Find $h'(2)$ if $h(x) = x\,g(x) - 2f(x)$.

(b) Find $h'(3)$ if $h(x) = x^3\,g(x)$.

(c) Find $h'(4)$ if $h(x) = \dfrac{f(x)}{g(x)}$.

Turn over.

2. (1 point) Use trig identities and the quotient rule to derive our formula for the derivative of $y = \sec x$ from the derivative rule for cosine.

3. (3 points) A potato is launched vertically upward with an initial velocity of $80\,\text{ft/s}$ from a potato gun at the top of an 96-foot-tall building. The distance in feet that the potato travels from the ground after t seconds is given by $s(t) = -16t^2 + 80t + 96$.

   (a) Determine when the potato hits the ground.

   (b) Determine the speed of the potato when it hits the ground.

   (c) Determine the maximum height of the potato.