DERIVATIVE RULES (3.1 – 3.4) NAME_____

Use the values in the table below to answer the following:

x	$f(x)$	$g(x)$	$h(x)$	$f'(x)$	$g'(x)$	$h'(x)$	$f''(x)$
0	0	1	2	-1	4	-5	0
1	3	2	1	3	-2	-4	-4
2	1	0	3	-2	3	2	1
3	2	3	0	4	2	-3	2

1. Determine if $y = f(x)g(x)$ has a horizontal tangent at $x = 1$.

2. Determine if $y = h(g(x))$ is increasing or decreasing at $x = 3$.

3. Find the equation of the tangent line to $y = f(g(x))$ at $x = 2$.

4. Find $u'(1)$ if $u(x) = \sqrt{h(x)+3}$.

5. Determine if $y = (f(x))^2$ is concave up or down at $x = 1$.

6. Find the slope of $y = \dfrac{g(x)}{x^3}$ at $x = 2$.

7. Find $u'(4)$ for $u(x) = h(\sqrt{x})$

8. Find the slope of the tangent line to $y = e^{g(x)}$ at $x = 0$.