Name_____

Differentiation Rules, with Tables

Date_____ Period____

For each problem, you are given a table containing some values of differentiable functions $f(x)$, $g(x)$ and their derivatives. Use the table data and the rules of differentiation to solve each problem.

1)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	1	1	2
2	3	0	3	0
3	2	−1	1	−2

Given $h(x) = f(x) + g(x)$, find $h'(1)$

2)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	−1	1	1
2	1	$\frac{1}{2}$	2	1
3	3	2	3	1

Given $h(x) = f(x) - g(x)$, find $h'(2)$

3)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	−1	1	2
2	1	$\frac{1}{2}$	3	0
3	3	2	1	−2

Given $h(x) = f(x) \cdot g(x)$, find $h'(3)$

4)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	3	−1	2	−1
2	2	−1	1	0
3	1	−1	2	1

Given $h(x) = \frac{f(x)}{g(x)}$, find $h'(3)$

5)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	5	-1	1	2
2	4	-1	3	$\frac{3}{2}$
3	3	-1	4	1
4	2	-1	5	1
5	1	0	6	$-\frac{1}{2}$
6	2	1	4	-2

Part 1) Given $h_1(x) = f(x) + g(x)$, find $h_1'(2)$

Part 2) Given $h_2(x) = f(x) - g(x)$, find $h_2'(3)$

Part 3) Given $h_3(x) = f(x) \cdot g(x)$, find $h_3'(4)$

Part 4) Given $h_4(x) = \dfrac{f(x)}{g(x)}$, find $h_4'(2)$

Part 5) Given $h_5(x) = (f(x))^2$, find $h_5'(2)$

Part 6) Given $h_6(x) = f(g(x))$, find $h_6'(6)$

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1)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	1	1	2
2	3	0	3	0
3	2	−1	1	−2

Given $h(x) = f(x) + g(x)$, find $h'(1)$

$h'(1) = f'(1) + g'(1) = 3$

2)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	−1	1	1
2	1	$\frac{1}{2}$	2	1
3	3	2	3	1

Given $h(x) = f(x) - g(x)$, find $h'(2)$

$h'(2) = f'(2) - g'(2) = -\frac{1}{2}$

3)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	2	−1	1	2
2	1	$\frac{1}{2}$	3	0
3	3	2	1	−2

Given $h(x) = f(x) \cdot g(x)$, find $h'(3)$

$h'(3) = f(3) \cdot g'(3) + g(3) \cdot f'(3) = -4$

4)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	3	−1	2	−1
2	2	−1	1	0
3	1	−1	2	1

Given $h(x) = \frac{f(x)}{g(x)}$, find $h'(3)$

$h'(3) = \frac{g(3) \cdot f'(3) - f(3) \cdot g'(3)}{(g(3))^2} = -\frac{3}{4}$

5)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	5	-1	1	2
2	4	-1	3	$\frac{3}{2}$
3	3	-1	4	1
4	2	-1	5	1
5	1	0	6	$-\frac{1}{2}$
6	2	1	4	-2

Part 1) Given $h_1(x) = f(x) + g(x)$, find $h_1'(2)$

Part 2) Given $h_2(x) = f(x) - g(x)$, find $h_2'(3)$

Part 3) Given $h_3(x) = f(x) \cdot g(x)$, find $h_3'(4)$

Part 4) Given $h_4(x) = \dfrac{f(x)}{g(x)}$, find $h_4'(2)$

Part 5) Given $h_5(x) = (f(x))^2$, find $h_5'(2)$

Part 6) Given $h_6(x) = f(g(x))$, find $h_6'(6)$

$h_1'(2) = f'(2) + g'(2) = \frac{1}{2}$

$h_2'(3) = f'(3) - g'(3) = -2$

$h_3'(4) = f(4) \cdot g'(4) + g(4) \cdot f'(4) = -3$

$h_4'(2) = \dfrac{g(2) \cdot f'(2) - f(2) \cdot g'(2)}{(g(2))^2} = -1$

$h_5'(2) = 2 \cdot f(2) \cdot f'(2) = -8$

$h_6'(6) = f'(g(6)) \cdot g'(6) = 2$

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