Calculus Practice: Chain Rule 8b

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	1	1	2	1
2	2	1	3	0
3	3	1	2	–1

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

2)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	1	1	3	–1
2	2	1	2	–1
3	3	1	1	–1

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

3)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(3)$

4)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

5)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

6)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(2)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

7)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

8)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

9)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(2)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

10)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(3)$

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1)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

$h_1'(1) = 2$
$h_2'(1) = 1$

2)

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
1	1	1	3	–1
2	2	1	2	–1
3	3	1	1	–1

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

$h_1'(3) = 6$
$h_2'(2) = -1$

3)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(3)$

$h_1'(3) = 4$
$h_2'(3) = 1$

4)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

$h_1'(3) = -4$
$h_2'(2) = \frac{1}{2}$

5)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

$h_1'(1) = -6$
$h_2'(1) = -1$

6)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(2)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

$h_1'(2) = 4$
$h_2'(2) = 0$

7)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(3)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

$h_1'(3) = 4$
$h_2'(2) = -1$

8)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(1)$

$h_1'(1) = 2$
$h_2'(1) = -2$

9)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(2)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(2)$

$h_1'(2) = 0$
$h_2'(2) = 0$

10)

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

Part 1) Given $h_1(x) = (f(x))^2$, find $h_1'(1)$
Part 2) Given $h_2(x) = f(g(x))$, find $h_2'(3)$

$h_1'(1) = -6$
$h_2'(3) = 2$