Name_____

## Assignment : Differentiation rule Using Table

Date_____

**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 | 4 | −2 |
| 2 | 2 | $\frac{3}{2}$ | 2 | $-\frac{3}{2}$ |
| 3 | 4 | 0 | 1 | $\frac{1}{2}$ |
| 4 | 2 | −2 | 3 | 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 $h_2'(1)$

2)

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

Part 1) Given $h_1(x) = f(x) + g(x)$, find $h_1'(4)$

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

3)

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 2 | 2 | 1 | 1 |
| 2 | 4 | $\frac{1}{2}$ | 2 | 1 |
| 3 | 3 | $-\frac{3}{2}$ | 3 | 1 |
| 4 | 1 | −2 | 4 | 1 |

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

Part 2) Given $h_2(x) = \dfrac{f(x)}{g(x)}$, find $h_2'(4)$

**4)**

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 4 | −1 | 3 | −2 |
| 2 | 3 | −1 | 1 | 0 |
| 3 | 2 | −1 | 3 | $\dfrac{3}{2}$ |
| 4 | 1 | −1 | 4 | 1 |

Part 1) Given $h_1(x) = f(x) \cdot g(x)$, find $h_1{}'(2)$

Part 2) Given $h_2(x) = \dfrac{f(x)}{g(x)}$, find $h_2{}'(2)$

**5)**

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 1 | 2 | 4 | −1 |
| 2 | 3 | $\dfrac{3}{2}$ | 3 | −1 |
| 3 | 4 | 0 | 2 | −1 |
| 4 | 3 | −1 | 1 | −1 |

Part 1) Given $h_1(x) = f(x) + g(x)$, find $h_1{}'(3)$

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

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

Part 4) Given $h_4(x) = \dfrac{f(x)}{g(x)}$, find $h_4{}'(3)$

Part 5) Given $h_5(x) = (f(x))^2$, find $h_5{}'(4)$

Part 6) Given $h_6(x) = f(g(x))$, find $h_6{}'(2)$

**6)**

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 1 | 2 | 2 | 2 |
| 2 | 3 | $\dfrac{3}{2}$ | 4 | 0 |
| 3 | 4 | 0 | 2 | $-\dfrac{3}{2}$ |
| 4 | 3 | −1 | 1 | −1 |

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 $h_2{}'(1)$

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 $h_4{}'(4)$

Part 5) Given $h_5(x) = (f(x))^2$, find $h_5{}'(4)$

Part 6) Given $h_6(x) = f(g(x))$, find $h_6{}'(2)$

7)

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 4 | $-1$ | 3 | $-1$ |
| 2 | 3 | $-\dfrac{3}{2}$ | 2 | $-1$ |
| 3 | 1 | 0 | 1 | $\dfrac{1}{2}$ |
| 4 | 3 | 2 | 3 | 2 |

Part 1) Given $h_1(x) = f(x) + g(x)$, find $h_1{}'(4)$

Part 2) Given $h_2(x) = f(x) - g(x)$, find $h_2{}'(1)$

Part 3) Given $h_3(x) = f(x) \cdot g(x)$, find $h_3{}'(2)$

Part 4) Given $h_4(x) = \dfrac{f(x)}{g(x)}$, find $h_4{}'(3)$

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

Part 6) Given $h_6(x) = f(g(x))$, find $h_6{}'(4)$

8)

| $x$ | $f(x)$ | $f'(x)$ | $g(x)$ | $g'(x)$ |
|---|---|---|---|---|
| 1 | 2 | 1 | 1 | 2 |
| 2 | 3 | 1 | 3 | $\dfrac{3}{2}$ |
| 3 | 4 | 0 | 4 | $-\dfrac{1}{2}$ |
| 4 | 3 | $-1$ | 2 | $-2$ |

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

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 $h_3{}'(2)$

Part 4) Given $h_4(x) = \dfrac{f(x)}{g(x)}$, find $h_4{}'(1)$

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

Part 6) Given $h_6(x) = f(g(x))$, find $h_6{}'(2)$

# Answers to Assignment : Differentiation rule Using Table

1) $h_1'(2) = 0$

   $h_2'(1) = 3$

2) $h_1'(4) = 4$

   $h_2'(1) = 0$

3) $h_1'(2) = 5$

   $h_2'(4) = -\dfrac{9}{16}$

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

   $h_2'(2) = -1$

5) $h_1'(3) = -1$

   $h_2'(2) = \dfrac{5}{2}$

   $h_3'(3) = -4$

   $h_4'(3) = 1$

   $h_5'(4) = -6$

   $h_6'(2) = 0$

6) $h_1'(2) = \dfrac{3}{2}$

   $h_2'(1) = 0$

   $h_3'(4) = -4$

   $h_4'(4) = 2$

   $h_5'(4) = -6$

   $h_6'(2) = 0$

7) $h_1'(4) = 4$

   $h_2'(1) = 0$

   $h_3'(2) = -6$

   $h_4'(3) = -\dfrac{1}{2}$

   $h_5'(2) = -9$

   $h_6'(4) = 0$

8) $h_1'(1) = 3$

   $h_2'(3) = \dfrac{1}{2}$

   $h_3'(2) = \dfrac{15}{2}$

   $h_4'(1) = -3$

   $h_5'(2) = 6$

   $h_6'(2) = 0$