AP Calculus Name_____

Derivatives in Function Notation Supplement D(1) Day 6

x	$f(x)$	$f'(x)$	$g(x)$	$g'(x)$
-2	3	1	-5	8
-1	-9	7	4	1
0	5	9	9	-3
1	3	-3	2	6
2	-5	3	8	?

Assume that $f(x)$ and $g(x)$ are differentiable functions about which we know very little. In fact, assume that all we know about these function is the table of data to the left.

This isn't a lot of information. For example, we can't compute $f'(3)$ with any degree of accuracy. But we are still able to figure some things out, using the rules of differentiation.

1. Let $w(x) = f(g(x))$. What is $w'(1)$?

2. Let $m(x) = \frac{g(x)}{f(x)}$. What is $m'(-2)$?

3. Let $b(x) = f(x)(2x-3)^2$. What is $b'(2)$?

4. Let $d(x) = f(\sqrt{x})$. What is $d'(0)$?

5. Let $h(x) = \left(\sqrt[3]{x}\right)^4 f(x)$. What is $h'(1)$?

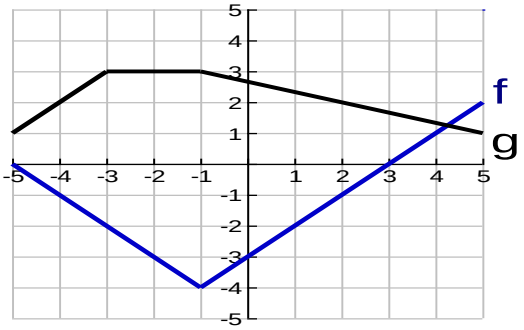
6. Let $j(x) = -4f(x)g(x)$. What is $j'(1)$?

7. Let $l(x) = x^3 g(x)$. If $l'(2) = -48$, what is $g'(2)$?

8. Let $k(x) = \frac{xf(x)}{g(x)}$. What is $k'(2)$?
Hint: use $g'(2)$ from #7

Answers:

1. $w'(1) = 18$ 2. $m'(-2) = \frac{29}{9}$ 3. $b'(2) = -17$ 4. $d'(0) = dne$ 5. $h'(1) = 1$ 6. $j'(1) = -48$ 7. $g(2) = -18$ 8. $k'(2) = -\frac{43}{16}$



Answers:

9. $w'(1) = 0$
10. $m'(2) = \frac{5}{12}$
11. $b'(-4) = -3e^{-8}$
12. $d'(4) = \frac{1}{3}$
13. $h'(2) = \frac{1}{2\sqrt{-1}} = \text{imaginary}$
14. $j'(1) = \frac{10}{3}$
15. $k'(2) = -\frac{1}{9}$
16. $\ell'(-4) = 64$

9. Let $w(x) = g(f(x))$. What is $w'(1)$?

10. Let $m(x) = \frac{f(x)}{g(x)}$. What is $m'(2)$?

11. Let $b(x) = f(x)e^{2x}$. What is $b'(-4)$?

12. Let $d(x) = f(\sqrt{2x+1})$. What is $d'(4)$?

13. Let $h(x) = \sqrt{f(x)}$. What is $h'(2)$?

14. Let $j(x) = f(x)g(2x)$. What is $j'(1)$?

15. Let $k(x) = \frac{secx}{f(x)}$. What is $k'(0)$?

16. Let $l(x) = 2x^3 g(x)$. What is $l'(-4)$