Practice for the Short Cuts.

One of the best ways to understand the various short cuts for finding derivatives is to practice by using numbers. After all, in "real life" you are more likely to encounter functions numerically (as data) rather than as formulas or equations.

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

Using the table above, find the following:

Example: Let $P(x)=\dfrac{f^2(x)}{x-1}$. Then

$$P'(0)=\frac{(0-1)2f(0)f'(0)-f^2(0)1}{(0-1)^2}=\frac{-2\times5\times9-5^2}{1}=-115$$

:

1. $h(x)=\sqrt{x}f(x)$ What is $h'(1)$?

2. $j(x)=-4f(x)g(x)$ What is $j'(0)$?

3. $k(x)=\dfrac{xf(x)}{g(x)}$ What is $k'(-2)$?

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

5. $m(x)=\dfrac{1}{f^3(x)}$. What is $m'(-1)$?

6. $n(x)=x^2f(x)g(x)$. What is $n'(0)$?