

# Product & Quotient Rules Worksheet

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1. Find the derivatives of the given functions.

(a)  $f(x) = (3x^2 + 6)(2x - \frac{1}{4})$

(b)  $f(x) = (2 - x - 3x^3)(7 + x^5)$

(c)  $y = \frac{1}{5x-3}$

(d)  $f(x) = \left(\frac{1}{x} + \frac{1}{x^2}\right)(3x^3 + 27)$

(e)  $y = \frac{3}{\sqrt{x+2}}$

(f)  $x = \frac{3t}{2t+1}$

(g)  $g(x) = \left(\frac{3x+2}{x}\right)(x^{-5} + 1)$

(h)  $y = (t^3 - 7t^2 + 1)e^t$

(i)  $y = \frac{t+1}{2^t}$

(j)  $g(r) = r \cdot 2^r$

2. Suppose  $f$  and  $g$  are differentiable functions with the values shown in the following table. For each of the following functions  $h$ , find  $h'(2)$ .

$x$	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
2	3	4	5	-2

(a)  $h(x) = f(x) + g(x)$

(b)  $h(x) = f(x)g(x)$

(c)  $h(x) = \frac{f(x)}{g(x)}$