

For each of the following, find $\frac{dy}{dx}$.

1. $y = \tan^2(3x^2 - 2x)$	2. $y = (4x+1)^2(1-x)^3$
3. $y = x^4(3x - 1)^3$	4. $\frac{2}{(5x+1)^3}$
5. $y = 4\sqrt{\cot x + \csc x}$	6. $y = \sqrt{3-2x}$
7. $y = \tan(\sec x)$	8. $s(t) = 12(2t+5)^{3/2}$
9. $y = 4\cot(8/x)$	10. $k(x) = -2(12x^2 + 5)^3$

11. Use the table given to answer the following questions. Please show me your work.

x	f(x)	f'(x)	g(x)	g'(x)
1	2	4	3	1
2	1	2	4	3
3	4	1	2	2
4	3	3	1	4

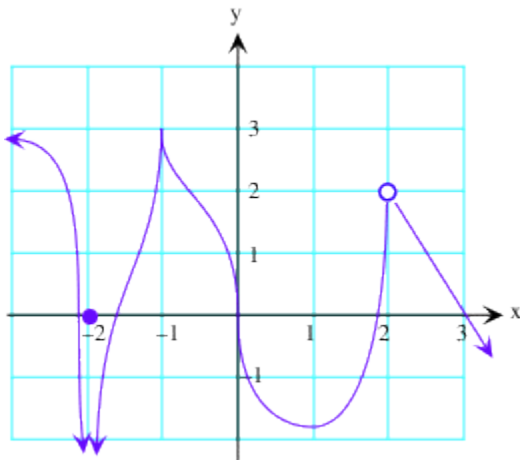
a.) If $h(x) = 3f(x) + 3g(x) - x^3$, find $h'(4)$.

b.) If $h(x) = (x^4 + x)g(x)$, find $h'(3)$.

c.) If $h(x) = \frac{3f(x)}{2g(x)}$, find $h'(2)$.

d.) If $h(x) = f(g(x))$, find $h'(1)$.

12. State all the points where the function is nondifferentiable.



x = _____

13. Determine whether the given function is continuous and/or differentiable at $x = 5$.

$$f(x) = \begin{cases} \frac{2x}{5} + 3, & x < 5 \\ \sqrt{4x+5}, & x \geq 5 \end{cases} \quad x = 5$$

14. Find the values of a and b that make the piecewise function continuous and differentiable.

$$f(x) = \begin{cases} ax + b, & x > -1 \\ bx^2 - 1, & x \leq -1 \end{cases}$$