

AP Calculus Chain Rule Examples/Review

Differentiate each function with respect to x .

1. $f(x) = \sqrt[4]{-3x^4 - 2}$

2. $y = (-x^4 - 3)^{-2}$

3. $y = \frac{(x^3 + 4)^5}{3x^4 - 2}$

4. $y = ((x + 5)^5 - 1)^4$

5. $f(x) = (4x^5 - 1)\sqrt[3]{x + 1}$

6. $y = \sqrt{-x^4 - 1}(-x - 2)$

7. $y = \sec 2x^4$

8. $f(x) = \sin 4x^3$

9. $y = \cot \sqrt[3]{-5x^3 - 2}$

10. $f(x) = \sin^5 7x$

11. $y = \sin 2x \cos 3x$

12. Use the following table to answer each question.

x	f(x)	f'(x)	g(x)	g'(x)
-1	2	5	1	0
0	-2	3	-1	4

a) The function p is given by $p(x) = f(\sin x)$. Find $p'(0)$.

b) The function P is given by $P(x) = x^2 g(\cos x) + f(g(x))$. Find $P'(0)$.

c) The function h is given by $H(x) = \frac{f(x^3)}{g(x)} + \sin(3x)$, find $H'(0)$