

More Power Rule and Chain Rule

Find the derivative.

1. $f(x) = -7x^{\frac{1}{4}}$

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

3. $f(x) = 4\sqrt{x} + \frac{1}{x^3}$

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

5. $f(x) = \sqrt{x+2}$

6. $f(x) = \sqrt[3]{x+7}$

7. $f(x) = 6(x+4)^{\frac{5}{3}}$

8. $f(x) = 3(x+1)^{-2}$

9. $f(x) = \frac{1}{x+5}$

10. $f(x) = -2(5x-3)^2$

11. $f(x) = 2(3x-5)^{10}$

12. $f(x) = 3(4x^2 - 3x - 9)^4$

13. $f(x) = (4x^3 - 3x + 2)^4$

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

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

16. $f(x) = \frac{x^2 + 5x - 1}{x^2}$

17. $f(x) = \frac{1+x-4\sqrt{x}}{x}$

18. $f(x) = \left(-1 - \frac{x}{2} - \frac{x^2}{4}\right)^2$

19. Find the equation of the line tangent to the function $y = \frac{x^2 + x - 2}{2x}$ where $x = -1$. (Point-Slope)

20. Let $f(x) = (x^2 + x - 5)^3$, find the equation of the line tangent at the point $x = -2$. (slope-intercept)

21. Let $f(x) = 2(-2x^4 + 2x^3 - 3x - 5)^3$, find the equation of the line tangent at the point $x = 1$. (General)

22. Find the tangents to the curve for $y = x^3 + x$ at all the points where the slope is 4 (be careful!...doesn't say $x = 4$)

23. Find the x- and y-intercepts of the line that is tangent to the curve $y = x^3$ at the point $(-2, -8)$

Given the following information, find the value of the derivative of the functions at $x = 3$. Not all the information is needed to calculate these.

| x | $f(x)$ | $g(x)$ | $f'(x)$ | $g'(x)$ |
|-----|--------|--------|---------|---------|
| 3 | 1 | 8 | -3 | -5 |
| 6 | 3 | -2 | 4 | 5 |
| 8 | -1 | 3 | π | 4 |
| 1 | 2 | -6 | 5 | 0 |

24. $f(x) + g(x)$

25. $\frac{1}{g(x)}$

26. $(f(x))^2$

27. $\sqrt{f(x)}$

28. $g(f(x))$

29. $f(g(x))$