

Use the rules of derivatives to find the derivative of the following functions:

1. $f(x) = 12$ 0
2. $y = -9$ 0
3. $f(x) = x^8$ $8x^7$
4. $f(x) = x^{-5}$ $-5x^{-6}$
5. $f(x) = \frac{1}{x^3}$ $-3x^{-4}$
6. $f(x) = \frac{2}{x^6}$ $-12x^{-7}$
7. $f(x) = x^{\frac{5}{2}}$ $\frac{5}{2}x^{\frac{3}{2}}$
8. $f(x) = \sqrt[5]{x}$ $\frac{1}{5}x^{-\frac{4}{5}}$
9. $f(x) = \sqrt[4]{x}$ $\frac{1}{4}x^{-\frac{3}{4}}$
10. $f(x) = x + 12$ 1
11. $f(x) = 2x - 3$ 2
12. $g(x) = x^2 + 2x + 3$ $2x + 2$
13. $g(t) = -2t^3 + 3t - 5$ $-6t^2 + 3$
14. $s(t) = 4t^3 + 5t^2 - 3t - 1$ $12t^2 + 10t - 3$
15. $f(t) = 2t^3 - t^2 + 5t$ $6t^2 - 2t + 5$
16. $f(x) = (x+2)^2 = x^2 + 4x + 4$
 $2x + 4$
17. $f(x) = x^2 + 5 - 7x^{-2}$ $2x + 14x^{-3}$
18. $f(x) = x^2 - \frac{4}{x^3}$ $2x + 12x^{-4}$
19. $f(x) = x + \frac{1}{x^2}$ $1 - 2x^{-3}$
20. $f(x) = \frac{x^3 + 1}{x^2}$ $1 - 2x^{-3}$
21. $f(x) = \frac{x^3 - 3x^2 + 4}{x^2}$ $1 - 8x^{-3}$
22. $f(x) = \sqrt{x} + 6\sqrt[3]{x}$ $\frac{1}{2}x^{-\frac{1}{2}} + 2x^{-\frac{2}{3}}$
23. $f(x) = 3x(6x - 5x^2)$ $= 18x^2 - 15x^3$
 $36x - 45x^2$
24. $f(x) = \sqrt[3]{x} + x^{\frac{4}{3}}$ $\frac{1}{3}x^{-\frac{2}{3}} + \frac{4}{3}x^{\frac{1}{3}}$

Find the slope of the graph of the function at the given point.

26. $f(x) = \frac{8}{x^2} - 16x^{-3}$ (2,2) $-\frac{16}{8} = -2$
27. $f(x) = 3 - \frac{3}{5x}$ $\left(\frac{3}{5}, 2\right)$ $\frac{3}{5} \left(\frac{5}{3}\right)^2 = \frac{5}{3}$
28. $f(x) = 3x^3 - 10$ (2,14) $9x^2 = 36$