

DÉRIVATION

1. $f(x) = x^2 + 2$

2. $f(x) = x^2 - 2x$

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

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

5. $f(x) = x^3 - 3x + 12$

6. $f(x) = -4x^3 + 3x^2 + 1$

7. $f(x) = \frac{1}{x} + 3$

8. $f(x) = \frac{1}{x} + 4x - 2$

9. $f(x) = \frac{1}{x^2}$

10. $f(x) = (2x + 3)(6 - x)$

11. $f(x) = (0,01 + 2x)(0,02 - 0,03x)$

12. $f(x) = \frac{1,05x + 0,7}{2,2x + 4,03}$

13. $f(x) = (4x - 5)^2$

14. $f(x) = (0,2 + 0,05x)^3$

15. $f(x) = \left(\frac{5}{x+4}\right)^2$

16. $u + v$

17. $u \times v$

18. $\frac{u}{v}$

19. u^n

20. $f(u)$

Diagram illustrating the derivation of various functions using the chain rule and product/quotient rules. The diagram shows the original function and its derivative, with arrows indicating the steps and rules used.

- $f(x) = x^2 + 2 \rightarrow f'(x) = 2x$
- $f(x) = x^2 - 2x \rightarrow f'(x) = 2x - 2$
- $f(x) = -3x^2 + 5 \rightarrow f'(x) = -6x$
- $f(x) = -3x^2 + x + 5 \rightarrow f'(x) = -6x + 1$
- $f(x) = x^3 - 3x + 12 \rightarrow f'(x) = 3x^2 - 3$
- $f(x) = -4x^3 + 3x^2 + 1 \rightarrow f'(x) = -12x^2 + 6x$
- $f(x) = \frac{1}{x} + 3 \rightarrow f'(x) = -\frac{1}{x^2}$
- $f(x) = \frac{1}{x} + 4x - 2 \rightarrow f'(x) = -\frac{1}{x^2} + 4$
- $f(x) = \frac{1}{x^2} \rightarrow f'(x) = -\frac{2}{x^3}$
- $f(x) = (2x + 3)(6 - x) \rightarrow f'(x) = 2(6 - x) - (2x + 3) = 12 - 2x - 2x - 3 = 9 - 4x$
- $f(x) = (0,01 + 2x)(0,02 - 0,03x) \rightarrow f'(x) = 2(0,02 - 0,03x) + (0,01 + 2x)(-0,03) = 0,04 - 0,06x - 0,03 - 0,06x = 0,01 - 0,12x$
- $f(x) = \frac{1,05x + 0,7}{2,2x + 4,03} \rightarrow f'(x) = \frac{1,05(2,2x + 4,03) - (1,05x + 0,7) \cdot 2,2}{(2,2x + 4,03)^2} = \frac{2,6915 - 2,6915}{(2,2x + 4,03)^2} = 0$
- $f(x) = (4x - 5)^2 \rightarrow f'(x) = 2(4x - 5) \cdot 4 = 8(4x - 5)$
- $f(x) = (0,2 + 0,05x)^3 \rightarrow f'(x) = 3(0,2 + 0,05x)^2 \cdot 0,05 = 0,000375(4 + x)^2$
- $f(x) = \left(\frac{5}{x+4}\right)^2 \rightarrow f'(x) = 2 \cdot \frac{5}{x+4} \cdot \left(-\frac{5}{(x+4)^2}\right) = -\frac{50}{(x+4)^3}$
- $u + v \rightarrow (u + v)' = u' + v'$
- $u \times v \rightarrow (u \times v)' = u' \times v + u \times v'$
- $\frac{u}{v} \rightarrow \left(\frac{u}{v}\right)' = \frac{u' \times v - u \times v'}{v^2}$
- $u^n \rightarrow (u^n)' = n \times u' \times u^{n-1}$
- $f(u) \rightarrow f'(u) \times u'$