

RAPPEL : dérivées des fonctions usuelles

fonction :	$f(x) = k$ (constante)	$f(x) = ax + b$	$f(x) = x^n$	$f(x) = \frac{1}{x^n}$	$f(x) = \sqrt{x}$
fonction dérivée :	$f'(x) = 0$	$f'(x) = a$	$f'(x) = nx^{n-1}$	$f'(x) = \frac{-n}{x^{n+1}}$	$f'(x) = \frac{1}{2\sqrt{x}}$

EXERCICE 5A.1 Déterminer la dérivée de la fonction f .

- $f(x) = 3x + 2$ **donc $f'(x) = 3$**
- $f(x) = x^5$
- $f(x) = -7x + 2$
- $f(x) = -5x + 7$
- $f(x) = \frac{1}{x^2}$
- $f(x) = 3$
- $f(x) = x$
- $f(x) = -x + 5$
- $f(x) = 5x - 5$
- $f(x) = x^4$
- $f(x) = \frac{1}{x^7}$
- $f(x) = -x$
- $f(x) = \frac{1}{x^3}$
- $f(x) = x^7$
- $f(x) = 0$
- $f(x) = 3 - 12x$
- $f(x) = \frac{1}{x^3}$
- $f(x) = \frac{1}{x^8}$
- $f(x) = \frac{1}{x^5}$
- $f(x) = \sqrt{x}$
- $f(x) = \frac{1}{x^{11}}$
- $f(x) = -7$
- $f(x) = 8 + x$
- $f(x) = \frac{1}{x}$

EXERCICE 5A.2 Déterminer la dérivée de la fonction f .

- $f(x) = x^5 + x^3$
- $f(x) = 5x^7$
- $f(x) = 3 \times \frac{1}{x^2}$
- $f(x) = 3x - \frac{1}{x}$
- $f(x) = 7x^5 + 3x^4 - 2x^3 - 5x^2 + x - 1$
- $f(x) = \frac{3}{x^4} + \frac{7}{x^2} - \frac{4}{x}$
- $f(x) = \frac{2}{x^3} - \frac{3}{x^4} + \frac{4}{x^5} - \frac{5}{x^6}$
- $f(x) = 3x^7 - \frac{8}{x^2} + \frac{2}{x} - 7x^3 + 5$

CORRIGE – NOTRE DAME DE LA MERCI – MONTPELLIER**EXERCICE 5A.1**Déterminer la dérivée de la fonction f .

1. $f(x) = 3x + 2$

donc $f'(x) = 3$

2. $f(x) = x^5$

$f'(x) = 5x^4$

3. $f(x) = -7x + 2$

$f'(x) = -7$

4. $f(x) = -5x + 7$

$f'(x) = -5$

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

$f'(x) = -\frac{2}{x^3}$

6. $f(x) = 3$

$f'(x) = 0$

7. $f(x) = x$

$f'(x) = 1$

8. $f(x) = -x + 5$

$f'(x) = -1$

9. $f(x) = 5x - 5$

$f'(x) = 5$

10. $f(x) = x^4$

$f'(x) = 4x^3$

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

$f'(x) = -\frac{7}{x^8}$

12. $f(x) = -x$

$f'(x) = -1$

13. $f(x) = \frac{1}{x^3} = x^{-3}$

$f'(x) = \frac{-3}{x^4} (= -3x^{-4})$

14. $f(x) = x^7$

$f'(x) = 7x^6$

15. $f(x) = 0$

$f'(x) = 0$

16. $f(x) = 3 - 12x$

$f'(x) = -12$

17. $f(x) = \frac{1}{x^3}$

$f'(x) = -\frac{3}{x^4}$

18. $f(x) = \frac{1}{x^8} = x^{-8}$

$f'(x) = \frac{-8}{x^9} (= -8x^{-9})$

19. $f(x) = \frac{1}{x^5}$

$f'(x) = -\frac{5}{x^6}$

20. $f(x) = \sqrt{x}$

$f'(x) = \frac{1}{2\sqrt{x}}$

21. $f(x) = \frac{1}{x^{11}}$

$f'(x) = -\frac{11}{x^{12}}$

22. $f(x) = -7$

$f'(x) = 0$

23. $f(x) = 8 + x$

$f'(x) = 1$

24. $f(x) = \frac{1}{x}$

$f'(x) = -\frac{1}{x^2}$

EXERCICE 5A.2Déterminer la dérivée de la fonction f .

1. $f(x) = x^5 + x^3$

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

2. $f(x) = 5x^7$

$f'(x) = 5 \times 7x^6 = 35x^6$

3. $f(x) = 3 \times \frac{1}{x^2} (= 3 \times x^{-2})$

$f'(x) = 3 \times \frac{-2}{x^3} = \frac{-6}{x^3} (= 3 \times (-2)x^{-3})$

4. $f(x) = 3x - \frac{1}{x}$

$f'(x) = 3 - \left(-\frac{1}{x^2}\right) = 3 + \frac{1}{x^2}$

5. $f(x) = 7x^5 + 3x^4 - 2x^3 - 5x^2 + x - 1$

$f'(x) = 35x^4 + 12x^3 - 6x^2 + 10x + 1$

6. $f(x) = \frac{3}{x^4} + \frac{7}{x^2} - \frac{4}{x} (= 3x^{-4} + 7x^{-2} - 4x^{-1})$

$f'(x) = 3 \times \frac{-4}{x^5} + 7 \times \frac{-2}{x^3} - 4 \times \frac{-1}{x^2} = -\frac{12}{x^5} - \frac{14}{x^3} + \frac{4}{x^2}$

7. $f(x) = \frac{2}{x^3} - \frac{3}{x^4} + \frac{4}{x^5} - \frac{5}{x^6}$

$f'(x) = 2 \times \frac{-3}{x^4} - 3 \times \frac{-4}{x^5} + 4 \times \frac{-5}{x^6} - 5 \times \frac{-6}{x^7} = \frac{-6}{x^4} + \frac{12}{x^5} - \frac{20}{x^6} + \frac{30}{x^7}$

8. $f(x) = 3x^7 - \frac{8}{x^2} + \frac{2}{x} - 7x^3 + 5$

$f'(x) = 21x^6 + \frac{16}{x^3} - \frac{2}{x^2} - 21x^2$