

**Série11: Etude des fonctions**

**Exercice 1**

Étudier les fonctions suivantes :

1.  $f(x) = x^3 - 3x + 1$
2.  $f(x) = x^4 - 2x^2 + 2$
3.  $f(x) = \frac{x^2-4}{x^2-1}$
4.  $f(x) = \frac{(x+1)^3}{x^2}$
5.  $f(x) = \frac{x^3}{x^2-1}$
6.  $f(x) = \sqrt{x^2 - 2x + 3}$
7.  $f(x) = 5x + \sqrt{x^2 - 1}$
8.  $f(x) = \sqrt{\frac{x-1}{x+1}}$
9.  $f(x) = \sqrt{x - 2x^2}$
10.  $f(x) = \frac{\sqrt{x}}{x+1}$
11.  $f(x) = \sin(x)$
12.  $f(x) = \cos(x)$
13.  $f(x) = \tan(x)$
14.  $f(x) = \frac{\sin(x)}{1+\cos(x)}$
15.  $f(x) = \frac{\cos(x)}{1+\cos(x)}$
16.  $f(x) = \frac{1}{1+\tan(x)}$
17.  $f(x) = \sqrt{\cos(2x) - \cos(x)}$
18.  $f(x) = \frac{\sin^3(x)}{(\sin(x)-1)^2}$
19.  $f(x) = \frac{\sin(2x)}{1+\sin(x)}$
20.  $f(x) = \cos^2(x)\sin(2x)$
21.  $f(x) = \frac{\sin(x)-1}{\cos(x)-1}$
22.  $f(x) = \frac{\sin(x)}{1-\cos(x)}$
23.  $f(x) = \frac{\cos(x)}{1-\cos(x)}$
24.  $f(x) = \cos(2x) - 2\cos(x)$
25.  $f(x) = \frac{\sin(x)}{\sin(x)+\cos(x)}$
26.  $f(x) = \cos^3(x)\cos(3x)$
27.  $f(x) = E(x) + (x - E(x))^2$
28.  $f(x) = x - 1 + \sqrt{x^2 + x + 1}$
29.  $f(x) = \frac{\sin(2x)}{1+\sin(x)}$
30.  $f(x) = \frac{1+\tan(x)}{\sin(x)}$
31.  $f(x) = \frac{\cos(2x)+1}{2\cos(x)-1}$
32.  $f(x) = \sqrt{\frac{x^3}{x-1}}$
33.  $f(x) = \frac{x(x+1)}{x-2}$
34.  $f(x) = \frac{1}{6}x^3 + \frac{1}{4}x^2 - 3x + 2$
35.  $f(x) = x^4 - 4x^2 + 1$
36.  $f(x) = x + 1 + \frac{2}{x-1}$
37.  $f(x) = \frac{x}{x-2\sqrt{x+2}}$
38.  $f(x) = \cos^4(x) + 3\sin^4(x) - 1$
39.  $f(x) = \cos^3(x) + \sin^2(x)$
40.  $f(x) = x - 1 - \frac{1}{x} + \frac{1}{x^2}$
41.  $f(x) = \frac{2x^2+5x+3}{x+2}$
42.  $f(x) = \sqrt{1+x^2} - x$
43.  $f(x) = \sqrt{1+x^2} + x$
44.  $f(x) = \frac{x+1}{\sqrt{2x^2+2}}$
45.  $f(x) = x - 2\sqrt{x-1}$
46.  $f(x) = x + 1 - \sqrt{x^2 - 2x}$
47.  $f(x) = \sqrt{\frac{x}{x^2+1}}$
48.  $f(x) = \sqrt{x^2 - |x| + 1}$
49.  $f(x) = x(\sqrt{x} - 2)^2$
50.  $f(x) = |x|\sqrt{x^2 - 1}$
51.  $f(x) = x - \sqrt{2x - 1}$

**Exercice 2**

**Exercice 3**

**Exercice 4**