Déterminez une fonction F qui soit une primitive de la fonction f ,
Trois propriétés très souvent utilisées sont : (c.f. cours page 23)

I) $\int \lambda \cdot g\left(f\left(x\right)\right) \cdot f'(x)\, dx = \lambda \cdot G(f(x)) + C$ où G est une primitive de g.

II) $\int \lambda \cdot f^n\left(x\right) \cdot f'(x)\, dx = \lambda \cdot \frac{f^{n+1}(x)}{n+1} + C$ où $n \in \mathbb{R} \setminus \{-1\}$.

III) $\int \lambda \cdot \left(f(x)\right)^{-1} \cdot f'\left(x\right) dx = \lambda \cdot \ln\left|f(x)\right| + C$

De plus on sait que : $\int \lambda \cdot x^n\, dx = \lambda \cdot \frac{x^{n+1}}{n+1} + C$ si $n \neq -1$ et $\int \lambda \cdot x^{-1}\, dx = \lambda \cdot \ln\left(\left|x\right|\right) + C \qquad C \in \mathbb{R}$

1)	$f\left(x\right) = x - 3 \cdot x^{-2}$	$F\left(x\right) = \frac{x^2}{2} - 3 \cdot \frac{x^{-1}}{-1} + C = \frac{x^2}{2} + \frac{3}{x} + C$
2)	$f\left(x\right) = 2x + 1 - x^{-2}$	$F\left(x\right) = x^2 + x - \frac{x^{-1}}{-1} + C = x^2 + x + \frac{1}{x} + C$
3)	$f\left(x\right) = \underset{\lambda}{\frac{1}{3}} \cdot \underset{f^n}{\left(3x+2\right)^6} \cdot \underset{f'}{\left(3x+2\right)'}$	$F\left(x\right) = \frac{1}{21} \cdot \left(3x+2\right)^7 + C$
4)	$f(x) = \underset{\lambda}{(-1)} \cdot \underset{f^n}{\cos^4\left(x\right)} \cdot \underset{f'}{\left(\cos(x)\right)'}$	$F(x) = -\frac{1}{5} \cdot \cos^5\left(x\right) + C$
5)	$f(x) = \underset{f^n}{\left(x^2+x+3\right)^{-2}} \cdot \underset{f'}{\left(x^2+x+3\right)'}$	$F\left(x\right) = \frac{\left(x^2+x+3\right)^{-1}}{-1} + C = -\frac{1}{x^2+x+3} + C$
6)	$f(x) = \underset{\lambda}{(1/2)} \cdot \underset{f^{-1}}{\left(x^2-2x+4\right)^{-1}} \cdot \underset{f'}{\left(x^2-2x+4\right)'}$	$F(x) = \ln\left(\left\|x^2-2x+4\right\|\right)/2 + C$
7)	$f(x) = \underset{f^{-1}}{\left(x^2-x-2\right)^{-1}} \cdot \underset{f'}{\left(x^2-x-2\right)'}$	$F(x) = \ln\left(\left\|x^2-x-2\right\|\right) + C$
8)	$f(x) = \underset{f^n}{\left(1-\cos\left(x\right)\right)^1} \cdot \underset{f'}{\left(1-\cos\left(x\right)\right)'}$	$F(x) = \left(1-cos\left(x\right)\right)^2/2 + C$
9)	$f(x) = \underset{\lambda}{(1/4)} \cdot \underset{f^n}{\left(4\cdot\sin\left(x\right)-1\right)^{-3}} \cdot \underset{f'}{\left(4\cdot\sin\left(x\right)-1\right)'}$	$F(x) = \frac{-1}{8 \cdot \left(4\cdot\sin\left(x\right)-1\right)^2} + C$
10)	$f(x) = 1 + tan^2\left(2x\right)$	$F(x) = \tan\left(2x\right)/2 + C$ c.f. ex. 18 série 5
11)	$f\left(x\right) = \underset{\lambda}{(1/2)} \cdot \underset{f^n}{\left(2x+1\right)^3} \cdot \underset{f'}{\left(2x+1\right)'}$	$F\left(x\right) = \frac{1}{8} \cdot \left(2x+1\right)^4 + C$
12)	$f(x) = \underset{\lambda}{(1/2)} \cdot \underset{f^{-1}}{\left(x^2-4\right)^{-1}} \cdot \underset{f'}{\left(x^2-4\right)'}$	$F(x) = \ln\left(\left\|x^2-4\right\|\right)/2 + C$
13)	$f(x) = \underset{f^{-1}}{\left(\ln(\left\|x\right\|)\right)^{-1}} \cdot \underset{f'}{\frac{1}{x}}$	$F(x) = \ln\left(\left\|\ln\left(\left\|x\right\|\right)\right\|\right) + C$

14)	$f(x)=\underset{\lambda}{2}\cdot\underset{f^{-1}}{\left(x^2+x+1\right)^{-1}}\cdot\underset{f'}{\left(x^2+x+1\right)'}$	$F(x)=2\cdot\ln\left(\left\|x^2+x+1\right\|\right)+C$
15)	$f\left(x\right)=2\cdot x^{-3}+\dfrac{x^{-2}}{2}$	$F\left(x\right)=2\cdot\dfrac{x^{-2}}{-2}+\dfrac{1}{2}\cdot\dfrac{x^{-1}}{-1}+C=-\dfrac{1}{x^2}-\dfrac{1}{2x}+C$
16)	$f(x)=\underset{f^n}{\ln\left(\left\|x\right\|\right)^1}\cdot\underset{f'}{\left(\ln\left(\left\|x\right\|\right)\right)'}$	$F(x)=\ln^2\left(\left\|x\right\|\right)/2+C$
17)	$f(x)=\underset{g(f(x))}{\exp\left(\sqrt{2x}\right)}\cdot\underset{f'}{\left(\sqrt{2x}\right)'}$	$F(x)=\underset{G(f(x))}{\exp\left(\sqrt{2x}\right)}+C=e^{\sqrt{2x}}+C$
18)	$f(x)=\underset{f^n}{\left(\sin(x)\right)^{\frac{1}{2}}}\cdot\underset{f'}{\left(\sin(x)\right)'}$	$F(x)=\dfrac{2}{3}\cdot\left(\sin\left(x\right)\right)^{\frac{3}{2}}+C=\dfrac{2}{3}\cdot\sqrt{\left(\sin\left(x\right)\right)^3}+C$
19)	$f(x)=\underset{\lambda}{(-1)}\cdot\underset{g(f(x))}{\exp(1/x)}\cdot\underset{f'}{\left(1/x\right)'}$	$F(x)=\underset{\lambda}{-}\underset{G(f(x))}{\exp(1/x)}+C=-e^{1/x}+C$
20)	$f\left(x\right)=x^{-\frac{1}{3}}$	$F\left(x\right)=x^{\frac{2}{3}}/\left(2/3\right)+C=\left(3/2\right)\cdot\sqrt[3]{x^2}+C$
21)	$f(x)=\dfrac{x^2+2x+1}{x}=x+2+\dfrac{1}{x}$	$F(x)=\dfrac{x^2}{2}+2x+\ln\left(\left\|x\right\|\right)+C$
22)	$f(x)=\underset{\lambda}{\left(1/3\right)}\cdot\underset{g(f(x))}{\exp\left(x^3\right)}\cdot\underset{f'}{\left(x^3\right)'}$	$F(x)=\left(1/3\right)\cdot\exp\left(x^3\right)+C=\left(1/3\right)\cdot e^{x^3}+C$
23)	$f\left(x\right)=x^{\frac{1}{3}}+x^{-\frac{1}{3}}$	$F\left(x\right)=\dfrac{3}{4}\cdot x^{\frac{4}{3}}+\dfrac{3}{2}\cdot x^{\frac{2}{3}}+C=\dfrac{3}{4}\cdot\sqrt[3]{x^4}+\dfrac{3}{2}\cdot\sqrt[3]{x^2}+C$
24)	$f(x)=2\cdot x^{\frac{1}{2}}+\sqrt{2}\cdot x^{\frac{1}{2}}$	$F(x)=\dfrac{4}{3}x^{\frac{3}{2}}+\dfrac{2\cdot\sqrt{2}}{3}\cdot x^{\frac{3}{2}}+C=\left(\dfrac{4}{3}+\dfrac{2\cdot\sqrt{2}}{3}\right)\cdot\sqrt{x^3}+C$
25)	$f\left(x\right)=\underset{\lambda}{\dfrac{1}{2a}}\cdot\underset{f^n}{\left(ax^2+b\right)^{\frac{1}{3}}}\cdot\underset{f'}{\left(ax^2+b\right)'},\quad a\neq 0$	$F\left(x\right)=\dfrac{1}{2a}\cdot\dfrac{3}{4}\left(ax^2+b\right)^{\frac{4}{3}}+C=\dfrac{3}{8a}\cdot\sqrt[3]{\left(ax^2+b\right)^4}+C$
26)	$f\left(x\right)=\underset{f^n}{\left(x^2+x+1\right)^{-\frac{1}{2}}}\cdot\underset{f'}{\left(x^2+x+1\right)'}$	$F\left(x\right)=2\cdot\left(x^2+x+1\right)^{\frac{1}{2}}+C=2\cdot\sqrt{x^2+x+1}+C$
27)	$f\left(x\right)=\underset{f^n}{\left(9+x^3\right)^{-\frac{1}{2}}}\cdot\underset{f'}{\left(9+x^3\right)'}$	$F\left(x\right)=2\cdot\left(9+x^3\right)^{\frac{1}{2}}+C=2\cdot\sqrt{9+x^3}+C$
28)	$f\left(x\right)=\underset{\lambda}{\left(1/5\right)}\cdot\underset{f^n}{\left(5x^3+8\right)^{-\frac{1}{2}}}\cdot\underset{f'}{\left(5x^3+8\right)'}$	$F\left(x\right)=\left(1/5\right)\cdot 2\cdot\left(5x^3+8\right)^{\frac{1}{2}}+C=\left(2/5\right)\cdot\sqrt{5x^3+8}+C$
29)	$f\left(x\right)=\underset{f^n}{\left(x^3+x+2\right)^{\frac{1}{2}}}\cdot\underset{f'}{\left(x^3+x+2\right)'}$	$F\left(x\right)=\dfrac{2}{3}\cdot\sqrt{\left(x^3+x+2\right)^3}=\dfrac{2}{3}\cdot\left(x^3+x+2\right)\cdot\sqrt{x^3+x+2}+C$
30)	$f(x)=\left(x+2\sqrt{x}\right)^2=x^2+4x^{\frac{3}{2}}+4x$	$F(x)=\dfrac{1}{3}x^3+4\cdot\dfrac{2}{5}\cdot x^{\frac{5}{2}}+2x^2+C=\dfrac{1}{3}x^3+\dfrac{8}{5}\sqrt{x^5}+2x^2+C$