1) Déterminer $f(x)$ telle que

a) $\int f(x)dx = \underbrace{5x^2-3x}_{F(x)}+C$ $\qquad f(x)=F'(x)=10x-3$

b) $\int f(x)dx = \underbrace{x-\frac{1}{x}}_{F(x)}+C$ $\qquad f(x)=F'(x)=1+\frac{1}{x^2}$

c) $\int f(x)\,dx = \underbrace{\sqrt{x}}_{F(x)}+C$ $\qquad f(x)=F'(x)=\frac{1}{2\sqrt{x}}$

2) a) Montrer que $F(x)=\frac{2x}{\sqrt{x+1}}-1$ est une primitive de

$$f(x)=\frac{x+2}{\sqrt{(x+1)^3}}$$

b) $\int \frac{x+2}{\sqrt{(x+1)^3}}dx = \frac{2x}{\sqrt{x+1}}+C$

2)a) $u = 2x \qquad v = \sqrt{x+1}$

$u' = 2 \qquad v' = \frac{1}{2\sqrt{x+1}}$

$$\Rightarrow \quad F'(x) = \frac{2\sqrt{x+1} - \cancel{2}x \cdot \frac{1}{\cancel{2}\sqrt{x+1}}}{x+1} = \frac{\frac{2(x+1)-x}{\sqrt{x+1}}}{x+1} = \frac{2x+2-x}{\sqrt{x+1}} \cdot \frac{1}{x+1}$$

$$= \frac{x+2}{(x+1)\sqrt{x+1}} = \frac{x+2}{\sqrt{(x+1)^3}} = f(x) \qquad \#$$