d) $\int \frac{x}{\sqrt{4x-1}}\,dx$ $\qquad u = 4x-1 \longrightarrow du = 4\,dx$

$= \int \frac{\frac{u+1}{4}}{\sqrt{u}}\,\frac{du}{4} = \frac{1}{16}\int \left(u^{\frac{1}{2}} + u^{-\frac{1}{2}}\right) du$

$= \frac{1}{16}\cdot\left[\frac{(4x-1)^{\frac{3}{2}}}{\frac{3}{2}} + \frac{(4x-1)^{\frac{1}{2}}}{\frac{1}{2}}\right] + C$

$= \frac{1}{24}(4x-1)^{\frac{3}{2}} + \frac{1}{8}(4x-1)^{\frac{1}{2}} + C$ (par parties ça va aussi)

e) $\int \arccos x\,dx$ $\qquad u = \arccos x \longrightarrow u' = \frac{-1}{\sqrt{1-x^2}}$

$v' = 1 \longrightarrow v = x$

$= x.\arccos x + \frac{1}{-2}\int \frac{-2x}{\sqrt{1-x^2}}\,dx = x.\arccos x - \frac{1}{2}\cdot\frac{(1-x^2)^{\frac{1}{2}}}{\frac{1}{2}} + C$

$= x.\arccos x - \sqrt{1-x^2} + C$

f) $\int \frac{x+1}{x^2+2x}\,dx = \int\left(\frac{\frac{1}{2}}{x} + \frac{\frac{1}{2}}{x+2}\right) dx$

$\frac{x+1}{x(x+2)} = \frac{A}{x} + \frac{B}{x+2}$

$x+1 = A(x+2) + Bx$

si $x=0 \longrightarrow 1 = 2A$

si $x=-2 \longrightarrow -1 = -2B$

$= \frac{1}{2}\ln|x| + \frac{1}{2}\ln|x+2| + C$

g) $\int \frac{2x+3}{x^2-2x-15}\,dx = \int \frac{2x+3}{(x+3)(x-5)}\,dx$

$\frac{2x+3}{(x+3)(x-5)} = \frac{A}{x+3} + \frac{B}{x-5}$

$2x+3 = A(x-5) + B(x+3)$

si $x=5 \longrightarrow 13 = 8B$

si $x=-3 \longrightarrow -3 = -8A$

$= \int\left(\frac{3/8}{x+3} + \frac{13/8}{x-5}\right) dx$

$= \frac{3}{8}\ln|x+3| + \frac{13}{8}\ln|x-5| + C$