Let $f(x) = 2x^5 + 2x + 2$, $x \geq 0$. Find the value of $(f^{-1})'$ at the point $6 = f(1)$.

**Solution:** For $x \geq 0$, $f$ is invertible (since it is a strictly increasing function), differentiable (since it is a polynomial function) and $f'(x) = 10x^4 + 2 \geq 0$. Therefore the assumptions of the theorem 1 (p. 370) are verified. Since $6 = f(1)$, we have $1 = f^{-1}(6)$ and, according to theorem 1:

$$
(f^{-1})'(6) = \frac{1}{f'(1)} = \frac{1}{10(1)^4 + 2} = \frac{1}{12}.
$$

Calculate $\int_{-1}^{0} \frac{3dx}{3x - 2}$.

**Solution:** Let’s consider the function $f(x) = 3x - 2$. This function is never 0 the interval in $[-1, 0]$, and, for every $x$ in $[-1, 0]$, we have $f'(x) = 3$. Let’s consider the change of variable $u = f(x)$. Then $du = f'(x)dx$, $u = -5$ when $x = -1$ and $u = -2$ when $x = 0$. As a result,

$$
\int_{-1}^{0} \frac{3dx}{3x - 2} = \int_{-5}^{-2} \frac{du}{u} = \ln(|u|)_{-5}^{-2} = \ln(2) - \ln(5) = \ln\left(\frac{2}{5}\right).
$$