Indefinite Integration Doubts

$\mathcal{D}1$. Evaluate

$$\int \{\lfloor x \rfloor\}\, dx$$

$\mathcal{D}2$. Evaluate

$$\int \frac{x^2+1}{2x^4-x^2+1}\, dx$$

$\mathcal{D}3$. Evaluate

$$\int \frac{-x^3}{\sqrt{15x^2+7x+1}}\, dx$$

$\mathcal{D}4$. Evaluate

$$\int (x-1)^1 01 \cdot x^2 6\, dx$$

$\mathcal{D}5$. Evaluate

$$\int x^{-2/3}(1+x^{2/3})^{-}1\, dx$$

$\mathcal{D}6$. Evaluate

$$\int \ln(\sin x)\, dx$$

$\mathcal{D}7$. Evaluate

$$\int \frac{1}{x+\sqrt{x^2-x+1}}\, dx$$

$\mathcal{D}8$. Evaluate

$$\int \frac{(\tan x)^{\,-7/6} - (\tan x)^{\,-17/6}}{\sqrt[3]{\tan x}\sqrt{\sec^2 x + \tan x} + \sqrt{\tan x}\sqrt[3]{\sec^2 x + \tan x}}\, dx$$

$\mathcal{D}9$. If $y(x-y)^2 = x$
then Evaluate,

$$\int \frac{1}{x-3y}\, dx$$

$\mathcal{D}10$. Evaluate

$$\int \frac{\sin x \left(\cos^2 x - \cos^2 \frac{\pi}{5}\right)\left(\cos^2 x - \cos^2 \frac{2\pi}{5}\right)}{\sin 5x}\, dx$$

$\mathcal{D}11$. Evaluate

$$\int \frac{\sin x - x\cos x}{x^2}\, dx$$

$\mathcal{D}12$. Evaluate

$$\int \left(\prod_{r=1}^{n} x + r\right)\left(\sum_{k=1}^{n} \frac{1}{x+k}\right)\, dx$$

$\mathcal{D}13$. Evaluate

$$\lim_{n\to\infty} \sum_{r=0}^{n} \frac{\binom{n}{r}}{n^r(r+3)}$$