8.2.28 $\int e^x \cdot \sin dx = \left[\int u v' dx = uv - \int v u' dx \right] =$

$= \left[\begin{matrix} u = \sin x \Rightarrow u' = \cos x \\ v' = e^x \Rightarrow v = \int v' dx = \int e^x dx = e^x \end{matrix} \right] =$

$= \sin x \cdot e^x - \int e^x \cdot \cos x \, dx = \left[\begin{matrix} u = \cos x \Rightarrow \\ v' = e^x \Rightarrow \end{matrix} \right.$

$\left. \begin{matrix} \Rightarrow u' = (\cos x)' = -\sin x \\ \Rightarrow v = \int v' dx = \int e^x dx = e^x \end{matrix} \right] = \sin x \cdot e^x - (\cos \cdot e^x -$

$- \int e^x \cdot (-\sin x) dx) = \sin x \cdot e^x - \cos x \cdot e^x -$

$- \int e^x \cdot \sin x \, dx + C$

$\int e^x \cdot \sin x \, dx = \sin x \cdot e^x - \cos x \cdot e^x - \int e^x \sin x dx +$

$+ \int e^x \sin x dx + \int e^x \sin x dx = e^x \cos x + e^x \sin x +$

$+ C$

2 см $\left[\begin{matrix} u = e^x \Rightarrow u' = e^x = e^x \\ v' = \sin x \Rightarrow v = \int v' dx = \int \sin x \, dx = -\cos x \end{matrix} \right] =$

$= e^x \cdot (-\cos x) - \int (-\cos x) \cdot e^x dx = \left[\begin{matrix} u = e^x \\ v' = \cos x \end{matrix} \right. -$

$\left. \begin{matrix} u' = (e^x)' = e^x \\ v' = \cos x \Rightarrow v = \int v' dx = \int \cos x \, dx = \sin x \end{matrix} \right] =$

$= -e^x \cos x + (e^x \cdot \sin x - \int \sin x \cdot e^x dx + C$

т.е. $\int e^x \sin x \cdot dx = e^x \cos x + e^x \sin x -$
$\int e^x \cdot \sin x dx + C$

$\int e^x \sin x dx + \int e^x \cdot \sin x dx = - e^x \cos x + e^x \cdot$
$\cdot \sin x + C$

8.2.29

$\int \sin(\ln x) dx = [\quad \int 1 \cdot \sin(\ln x) dx =$
$= \left[\begin{array}{l} u = \sin(\ln x) \Rightarrow u' = (\sin(\ln x)) = \cos(\ln x) \cdot \frac{1}{x} \\ \cancel{v'} = 1 \Rightarrow v = x \end{array} \right]$
$= \sin(\ln x) x - \int x \cdot \cos(\ln x) \cdot \frac{1}{x} dx =$
$= x \cdot \sin(\ln x) - \int \cos(\ln x) dx = x \cdot \sin \ln x$
$- \int 1 \cdot \cos(\ln x) dx = \left[\begin{array}{l} u = \cos \ln x \Rightarrow u' = -\sin \ln x \\ v = \int v' dx = \int 1 dx = x \end{array} \right.$
$\cdot \left. \frac{1}{x} \right] = x \cdot \sin \ln x - (\cos(\ln x) \cdot x -$
$\int x \cdot (-\sin(\ln x)) \cdot \frac{1}{x} dx = x \cdot \sin \ln x - x \cdot \cos \ln x$
$- \int \sin(\ln x) dx$

т.е.

$\int \sin(\ln x) dx = x(\sin(\ln x) -$
$\cos(\ln x)) - \int \sin(\ln x) \cdot dx + C \ldots =$

2сп $\int \sin(\ln x)\,dx = \Big[t = \ln x \Rightarrow dt = d(\ln x) =$

$(\ln x)'\,dx = \frac{1}{x}dx \Big]$:(

$\Big[t = \ln x \Rightarrow x = e^t \Rightarrow dx = d(e^t) = e^{t'}dt \Big] =$

$= \int \sin t \cdot e^t\,dt = \Big[\begin{matrix} \text{номер} \\ 8.2.28 \end{matrix} \Big] = \frac{1}{2} e^{\ln x} \cdot$

$\cdot (\sin(\ln x) - \cos(\ln x)) + C$

8.2.31

$\int \arcsin x\,dx = \int 1 \cdot \arcsin x\,dx = \Big[\begin{matrix} u = \arcsin x \\ v' = 1 \end{matrix} \Big] =$

$= x \arcsin x - \int \frac{x}{\sqrt{1-x^2}} = \Big[\begin{matrix} t = x^2 \\ dt = 2x\,dx \end{matrix} \Big] =$

$= x \arcsin x - \int \frac{\frac{1}{2}dt}{\sqrt{1-t}} = \arcsin x - \frac{1}{2} \int \frac{\frac{1}{2}dt}{\sqrt{1-t}} =$

$= x \arcsin x + \frac{1}{2} \int z^{\frac{1}{2}}\,dz = x \arcsin x +$

$+ \frac{1}{2} \cdot z^2 + C = x \arcsin x + (1-x^2)^{\frac{1}{2}} + C =$

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

8.2.32

$\int \frac{\ln \ln x}{x}\,dx = \Big[\begin{matrix} t \cdot \ln x & x = e^t \\ dt \cdot d(\ln t) \cdot d \end{matrix} \Big] = \int \ln t\,dt =$

$= \int 1 \ln t\,dt \cdot \Big[\begin{matrix} u \cdot \ln t \\ v' = 1 \end{matrix} \Rightarrow \begin{matrix} u' = (\ln t)' = \frac{1}{t} \\ v = \int v'\,dt = x \end{matrix} \Big] =$

$= t \ln t - \int t \frac{1}{t} \cdot dt = t \ln t - t + C =$

$= \ln x \ln \ln x - \ln x + C$

8.3.2

$$\int \frac{4dx}{x+3} = \left[\begin{matrix} 1 \text{ тип} \\ \frac{A}{x-a} \end{matrix} \right] = 4\int \frac{dx}{x+3} = 4\int \frac{d(x+3)}{x+3}$$

$$= 4\ln|x+3| + C$$

8.3.3 $$\int \frac{dx}{(x-1)^5} = \left[\begin{matrix} 2 \text{ тип} \\ \frac{A}{(x-a)^k} \end{matrix} \right] = \int \frac{d(x-1)}{(x-1)^5} =$$

$$= \frac{(x-1)^{-5+1}}{-5+1} + C = -\frac{1}{4}(x-1)^{-4} + C =$$

$$= -\frac{1}{4(x-1)^4} + C$$

8.3.4 $$\int \frac{11\,dx}{(x+2)^3} = \left[\begin{matrix} 2 \text{ тип} \\ \frac{A}{(x+a)^3} \end{matrix} \right] = 11\int \frac{d(x+2)}{(x+2)^3} =$$

$$= 11 \cdot \frac{(x+2)^{-2}}{-2} + C = -\frac{11}{2} \cdot \frac{1}{(x+2)^2} + C$$