Tabular

$$\int x^2 (3x+1)^{1/2}\,dx = \boxed{\frac{2}{9}x^2(3x+1)^{3/2} - \frac{8x}{135}(3x+1)^{5/2} + \frac{16}{2835}(3x+1)^{7/2} + C}$$

x^2	$(3x+1)^{1/2}$
$2x$	$\frac{2}{9}(3x+1)^{3/2}$
2	$\frac{4}{135}(3x+1)^{5/2}$
0	$\frac{8}{2835}(3x+1)^{7/2}$

$\cancel{\frac{12}{15}} \cdot \cancel{\frac{2}{9}}$

$\frac{2}{7} \cdot \frac{1}{3} \cdot \frac{4}{135}$

Solve the initial value problem

	11. $\frac{dy}{dx} = (x+2)\sin x \quad y = 2 \text{ and } x = 0$ $\int dy = \int (x+2)\sin x\, dx$ $(x+2) \mid \sin x$ $1 \mid -\cos x$ $0 \mid -\sin x$ $y = -(x+2)\cos x + \sin x + C$ $2 = -2 + C$ $4 = C$ $\boxed{y = -(x+2)\cos x + \sin x + 4}$ 16. $\frac{dy}{dx} = 2x\sqrt{x+2} \quad y(\overset{x}{-1}) = \overset{y}{0}$ $\int dy = \int 2x (x+2)^{1/2} dx$ $2x \mid (x+2)^{1/2}$ $2 \mid \frac{2}{3}(x+2)^{3/2}$ $0 \mid \frac{4}{15}(x+2)^{5/2}$ $y = \frac{4x}{3}(x+2)^{3/2} - \frac{8}{15}(x+2)^{5/2} + C$ $0 = -\frac{4}{3} - \frac{8}{15} + C$ $0 = -\frac{28}{15} + C$ $y = \frac{4x}{3}(x+2)^{3/2} - \frac{8}{15}(x+2)^{5/2} + \frac{28}{15}$

Use tabular integration to integrate the following

10. $\int x^2 \ln x dx$ $= \int$ $\begin{array}{c|c} \ln x & x^2 \, dx \\ \hline \frac{1}{x} & \frac{1}{3}x^3 \end{array}$

$$\int x^2 \ln x = \frac{1}{3}x^3 \ln x - \int \frac{1}{x} \cdot \frac{x^3}{3} \, dx$$

$$= \frac{1}{3}x^3 \ln x - \int \frac{1}{3}x^2 \, dx$$

$$\boxed{= \frac{1}{3}x^3 \ln x - \frac{1}{9}x^3 + C}$$

Use ultra violet minus super vdu to integrate the following

10. $\int x^2 \ln x dx$

$\int (\arcsin x)(1\,dx)$	Use tabular integration to integrate the following

A. $\int \arcsin(x)dx = x\arcsin x - \int \frac{x}{\sqrt{1-x^2}}$

$\frac{1}{\sqrt{1-x^2}} \rightarrow x$

$= x\arcsin x - \int x(1-x^2)^{-1/2}$

$\boxed{= x\arcsin x + (1-x^2)^{1/2} + C}$

19. $\int e^x \cos(2x)dx$