$\int (x + 1)\sqrt{x + 3}\ dx$

$u = x+3 \rightarrow du = dx$

$u = x+2+1$

$u-2 = x+1$

$\int (u-2)\cdot\sqrt{u}\ du \qquad u^{1/2}$

$\int (u-2)\cdot u^{1/2}\ du$

$\int u^{3/2} - 2u^{1/2}\ du$

$\int \frac{u^{3/2+1}}{\cancel{3}/2+1} du - 2\int u^{1/2}\ du$

$\frac{2}{5}\cdot u^{5/2} - 2\cdot\frac{2}{3}\cdot u^{3/2} + C$

$\boxed{\frac{2}{5}\cdot(x+3)^{5/2} - \frac{4}{3}\cdot(x+3)^{3/2} + C}$

$I = \int e^x \sin(x)\ dx$ ILATE-

$u = \sin(x) \qquad dv = e^x\ dx$

$du = \cos(x)\ dx \qquad v = e^x$

$uv - \int v\ du$

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

$u = \cos(x) \qquad dv = e^x\ dx$

$du = -\text{sen}(x) \qquad v = e^x$

$\sin(x)\cdot e^x - [\cos(x)\cdot e^x + \int e^x \cdot \text{sen}(x)\ dx]$

$I = \sin(x)\cdot e^x - [\cos(x)\cdot e^x + \int e^x\ \text{sen}(x)\ dx]$

I

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

$2I = \sin(x)\cdot e^x - \cos(x)\cdot e^x$

$\boxed{I = \frac{\sin(x)\cdot e^x - \cos(x)\cdot e^x}{2} + C}$

$\int e^x\sqrt{1 - e^{2x}}\ dx$

$(z = e^x)^2 \rightarrow dz = e^x\ dx$

$z^2 = e^{2x} \qquad \boxed{\int\sqrt{1-z^2}\ dz} \qquad a^2 - x^2 \rightarrow z^2$

$x = \text{sen}(\alpha) \qquad z = \text{sen}(\alpha)$

$dx = \cos(\alpha)\ d\alpha \qquad dz = \cos(\alpha)\ d\alpha$

$\int\sqrt{1-\text{sen}^2(\alpha)}\cdot\cos(\alpha)\ d\alpha$

$\cos^2(\alpha) + \text{sen}^2(\alpha) = 1$

$\cos^2(\alpha) = 1 - \text{sen}^2(\alpha)$

$\int\sqrt{\cos^2(\alpha)}\ \cos(\alpha)\ d\alpha$

$\int |\cos(\alpha)|\cdot\cos(\alpha)\ d\alpha \qquad \geq 0$

$\int \cos(\alpha)\cdot\cos(\alpha)\ d\alpha$

$\int \cos^2(\alpha)\ d\alpha \qquad \cos^2(\alpha) = \frac{1+\cos(2\alpha)}{2}$

$\int\frac{1+\cos(2\alpha)}{2}\ d\alpha = \frac{1}{2}\left[\int 1\ d\alpha + \int\cos(2\alpha)\ d\alpha\right]$

$= \frac{1}{2}\alpha + \frac{1}{2}\cdot\frac{1}{2}\cdot\text{sen}(2\alpha)$

$\int\cos(a\alpha) = \frac{1}{a}\cdot\text{sen}(\alpha)$

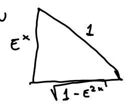
$= \frac{1}{2}\alpha + \frac{1}{4}\text{sen}(2\alpha) + C$

$\frac{e^x}{1} = \text{sen}(\alpha) \qquad \frac{\text{CAT OP}}{\text{HIP}}$

$z = \text{sen}(\alpha)$

$e^x = \text{sen}(\alpha)$ / ARC SEN

$\alpha = \text{arcsen}(e^x)$



$\text{sen}(2\alpha) = 2\,\text{sen}(\alpha)\cdot\cos(\alpha)$

$\text{sen}(\alpha) = e^x\cdot\sqrt{1-e^{2x}}$

$\boxed{I = \frac{1}{2}\text{arcsen}(e^x) + \frac{1}{4}\cdot 2\, e^x\cdot\sqrt{1-e^{2x}} + C}$