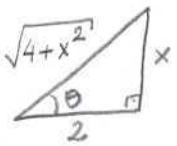
2) Evaluate the following integrals.

a) $\int \ln(x^{112})dx = 112\int \ln x\, dx$

$u=\ln x, dv=dx$ $= 112\left(x\ln x - \int dx\right)$

$= 112x(\ln x - 1) + C.$



b) $\int \frac{dx}{x^2\sqrt{x^2+4}}$ $x=2\tan\theta$ $= \int \frac{2\sec^2\theta\, d\theta}{(4\tan^2\theta)(2\sec\theta)}$

$= \frac{1}{4}\int \frac{\sec\theta}{\tan^2\theta}\, d\theta$

$= \frac{1}{4}\int \frac{\cos\theta}{\sin^2\theta}\, d\theta$

$= -\frac{1}{4\sin\theta} + C$

$= -\frac{\sqrt{4+x^2}}{4x} + C.$