#1. $\int_{-1}^{2} x\sqrt{x+2}\,dx$

#2. $\int \frac{\sec^2 x}{\sqrt{1-\tan^2 x}}\,dx$

#3. Use the given values of a and b to express the limit as a definite integral and evaluate the integral

$$\lim_{\max \Delta x_k \to 0} \sum_{k=1}^{n} (\sin x^*_k)\Delta x_k \; ; \quad a = 0 \quad b = \frac{\pi}{3}$$

#4 $\int x \ln x\,dx$

#5 $\int \sqrt{4-x^2}\,dx$

#6 Find $\frac{dy}{dx}$ for $y - x\ln x + e^{x^2}$