

$$\begin{aligned} \text{к) имеем: } \int \frac{\sin x \cos^3 x}{1 + \cos^2 x} dx &= \int \frac{\sin x \cos x ((\cos^2 x + 1) - 1)}{1 + \cos^2 x} dx = \\ &= \left[\begin{array}{l} t = 1 + \cos^2 x \\ dt = -2 \cos x \sin x dx \end{array} \right] = -\frac{1}{2} \int \frac{t-1}{t} dt = -\frac{t}{2} + \frac{1}{2} \ln|t| + C = \\ &= \frac{1 + \cos^2 x}{2} + \frac{1}{2} \ln|1 + \cos^2 x| + C . \end{aligned}$$