№7. $\int \frac{\sqrt{x^2-8}}{x^4}dx = \left[t=\frac{1}{x} \Rightarrow dt = \frac{-dx}{x^2} \right] =$

$= -\int \frac{\sqrt{\frac{1}{t^2}-8}\,dt}{\frac{1}{t^2}} = -\int \frac{\sqrt{1-8t^2}\,t^2\,dt}{t} =$

$= -\int \sqrt{1-8t^2}\;t\,dt = \frac{1}{16}\int \sqrt{1-8t^2}\,d(1-8t^2) =$

$= \frac{1}{16}\cdot\frac{2}{3}\sqrt{(1-8t^2)^3}+C = \frac{1}{24}\sqrt{\left(1-\frac{8}{x^2}\right)^3}+C =$

$= \frac{1}{24}\cdot\frac{\sqrt{(x^2-8)^3}}{x^3}+C$

Произведем проверку:

$\left(\frac{1}{24}\cdot\frac{\sqrt{(x^2-8)^3}}{x^3}\right)' = \frac{1}{24}\cdot\frac{\frac{3x^3}{2}\cdot\sqrt{x^2-8}\cdot 2x-3x^2\sqrt{(x^2-8)^3}}{x^6} =$

$= \frac{1}{8}\cdot\frac{\sqrt{x^2-8}\,(x^2-(x^2-8))}{x^4} = \frac{\sqrt{x^2-8}}{x^4}$

Ответ: $\frac{1}{24}\cdot\frac{\sqrt{(x-8)^3}}{x^3}+C$.