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Let $f'(x)=\dfrac{x^8+2x^3-x^{\frac{2}{3}}-3}{x^2}$

$$= x^6+2x-x^{-\frac{4}{3}}-3x^{-2}.$$

$$d(f(x)) = f'(x)\,dx$$

$$\Rightarrow \int f'(x)\,dx = \frac{x^7}{7+1}+2\frac{x^2}{1+1}-\frac{x^{-\frac{1}{3}}}{-\frac{4}{5}+\frac{3}{3}}-3\frac{x^{-1}}{-2+1}+C$$

$$= \frac{x^7}{8}+x^2+3x^{-\frac{1}{3}}+3x^{-1}+C$$

Set $C=0 \Rightarrow \int \dfrac{x^8+2x^3-x^{\frac{2}{3}}+3}{x^2} = \dfrac{x^7}{8}+x^2+3x^{-\frac{1}{3}}+3x^{-1}$