Calculus Assignment # 10

Evaluate each of the following integrals please.

(1) $\int \frac{dx}{\sqrt{25 + x^2}}$

(2) $\int \frac{dx}{\sqrt{x^2 - 4}}$

(3) $\int \frac{\sqrt{1 - x^2}\, dx}{x^2}$

(4) $\int \sqrt{x^2 - 4}\, dx$

(5) $\int x^3 \sqrt{x^2 + 4}\, dx$

(6) $\int \frac{x^2\, dx}{\left(4 - x^2\right)^{\frac{5}{2}}}$

(7) $\int \frac{dx}{\left(9 + x^2\right)^2}$

(8) $\int \frac{dx}{\left(25 - x^2\right)^{\frac{3}{2}}}$

(9) $\int \frac{dx}{x\sqrt{4x^2 + 9}}$

(10) $\int \frac{dx}{\sqrt{x^2 - 2x - 3}}$

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Answers

(1) $\ln\left|\sqrt{25 + x^2} + x\right| + C$

(2) $\ln\left|x + \sqrt{x^2 - 4}\right| + C$

(3) $-\frac{\sqrt{1 - x^2}}{x} - \sin^{-1}(x) + C$

(4) $\frac{1}{2}x\sqrt{x^2 - 4} - 2\ln\left|x + \sqrt{x^2 - 4}\right| + C$

(5) $\frac{1}{5}\left(x^2 + 4\right)^{\frac{5}{2}} - \frac{4}{3}\left(x^2 + 4\right)^{\frac{3}{2}} + C$

(6) $\frac{x^3}{12\left(4 - x^2\right)^{\frac{3}{2}}} + C$

(7) $\frac{1}{54}\tan^{-1}\left(\frac{x}{3}\right) + \frac{x}{18\left(9 + x^2\right)} + C$

(8) $\frac{x}{25\sqrt{25 - x^2}} + C$

(9) $\frac{1}{3}\ln\left|\frac{\sqrt{4x^2 + 9} - 3}{2x}\right| + C$

(10) $\ln\left|x - 1 + \sqrt{x^2 - 2x - 3}\right| + C$