

I) IN EACH OF THE FOLLOWING SETS OF INTEGRALS, IDENTIFY THE INTEGRAL WHICH DOES NOT REQUIRE INTEGRATION BY PARTS!

① a) $\int x e^{2x} dx$

b) $\int x e^{-2x^2} dx$

c) $\int x^3 e^{2x} dx$

② a) $\int \frac{(\ln x)^3}{x^2} dx$

b) $\int (\ln x)^3 dx$

c) $\int \frac{(\ln x)^3}{x} dx$

③ a) $\int e^{\sqrt{x}} dx$

b) $\int \frac{e^{\sqrt{x}}}{\sqrt{x}} dx$

c) $\int \sqrt{x} e^{\sqrt{x}} dx$

④ a) $\int x^2 \sin x^3 dx$

b) $\int x^3 \sin x^2 dx$

c) $\int x^2 \sin 5x dx$

⑤ a) $\int \tan^{-1} x dx$

b) $\int x^2 \tan^{-1} x dx$

c) $\int \frac{\tan^{-1} x}{x^2 + 1} dx$

II) ① FIND $\int \sec^3 \theta d\theta$ USING INTEGRATION BY PARTS.

② FIND $\int \frac{x^2}{(x^2 + 4)^2} dx$ USING INTEGRATION BY PARTS.

③ FIND $\int \frac{1}{e^x + 4} dx$

a) BY MULTIPLYING BY $\frac{e^{-x}}{e^{-x}}$.

b) BY SUBSTITUTING $u = e^x$.

④ FIND $\int \frac{3x + 11}{x^2 - 6x + 13} dx$.

⑤ FIND $\int \frac{\sqrt{x}}{x^2 - 1} dx$.