Assignment Integration by parts

Evaluate each indefinite integral using integration by parts. *u* and *dv* are provided.

1) $\int x^2 e^x \, dx; \ \ u = x^2, \ dv = e^x \, dx$

2) $\int x^2 \cos x \, dx; \ \ u = x^2, \ dv = \cos x \, dx$

3) $\int x^2 \sin x \, dx; \ \ u = x^2, \ dv = \sin x \, dx$

4) $\int \dfrac{\ln x}{\sqrt{x}} \, dx; \ \ u = \ln x, \ dv = \dfrac{1}{\sqrt{x}} \, dx$

5) $\int x \ln x^2 \, dx; \ \ u = \ln x^2, \ dv = x \, dx$

6) $\int x \ln x \, dx; \ \ u = \ln x, \ dv = x \, dx$

7) $\int x \sin x \, dx; \ \ u = x, \ dv = \sin x \, dx$

8) $\int \dfrac{\ln x}{\sqrt{x}} \, dx; \ \ u = \ln x, \ dv = \dfrac{1}{\sqrt{x}} \, dx$

9) $\int x \ln x \, dx; \ \ u = \ln x, \ dv = x \, dx$

10) $\int x \sin x \, dx; \ \ u = x, \ dv = \sin x \, dx$

Answers to Assignment Integration by parts

1) $x^2e^x - 2xe^x + 2e^x + C$

2) $x^2\sin x + 2x\cos x - 2\sin x + C$

3) $-x^2\cos x + 2x\sin x + 2\cos x + C$

4) $2x^{\frac{1}{2}}\ln x - 4x^{\frac{1}{2}} + C$

5) $\dfrac{x^2\ln x^2 - x^2}{2} + C$

6) $\dfrac{2x^2\ln x - x^2}{4} + C$

7) $-x\cos x + \sin x + C$

8) $2x^{\frac{1}{2}}\ln x - 4x^{\frac{1}{2}} + C$

9) $\dfrac{2x^2\ln x - x^2}{4} + C$

10) $-x\cos x + \sin x + C$