The questions below may require that you use one or more of the following techniques:

u-substitution

integration by parts

trigonometric substitution

trigonometric identities

trigonometric reduction formulae

[1] $\int x^2\sqrt{1+x^2}\,dx$

[2] $\int \tan^4 x \sec^6 x\,dx$

[3] $\int x^2 \arcsin 2x^3 dx$

[4] $\int (x-1)\sqrt{1-2x}\,dx$

[5] $\int \sqrt{x}(\ln x)^3 dx$

[6] $\int x^3\sqrt{4-x^2}\,dx$

[7] $\int (x^2\sin 3x - 2x\cos 4x)\,dx$

[8] $\int x^2\sqrt{6-4x^2}\,dx$

[9] $\int \frac{x^2}{\sqrt{2x^2-12x}}\,dx$

[10] $\int e^{-5x}\cosh 3x\,dx$

[11] $\int \sin^5 x \cos^7 x\,dx$

[12] $\int (1+2x-x^3)e^{-2x}dx$

[13] $\int e^{-3x}\sin 2x\,dx$

[14] $\int \frac{(\ln x)^3}{x}dx$

You **may or may not** need the following reduction formulae:

if $n \neq 0$: $\int \sin^n u\,du = -\frac{1}{n}\sin^{n-1} u\cos u + \frac{n-1}{n}\int \sin^{n-2} u\,du$

$\int \cos^n u\,du = \frac{1}{n}\cos^{n-1} u\sin u + \frac{n-1}{n}\int \cos^{n-2} u\,du$

if $n \neq 1$: $\int \sec^n u\,du = \frac{1}{n-1}\sec^{n-2} u\tan u + \frac{n-2}{n-1}\int \sec^{n-2} u\,du$