Methods of Integration

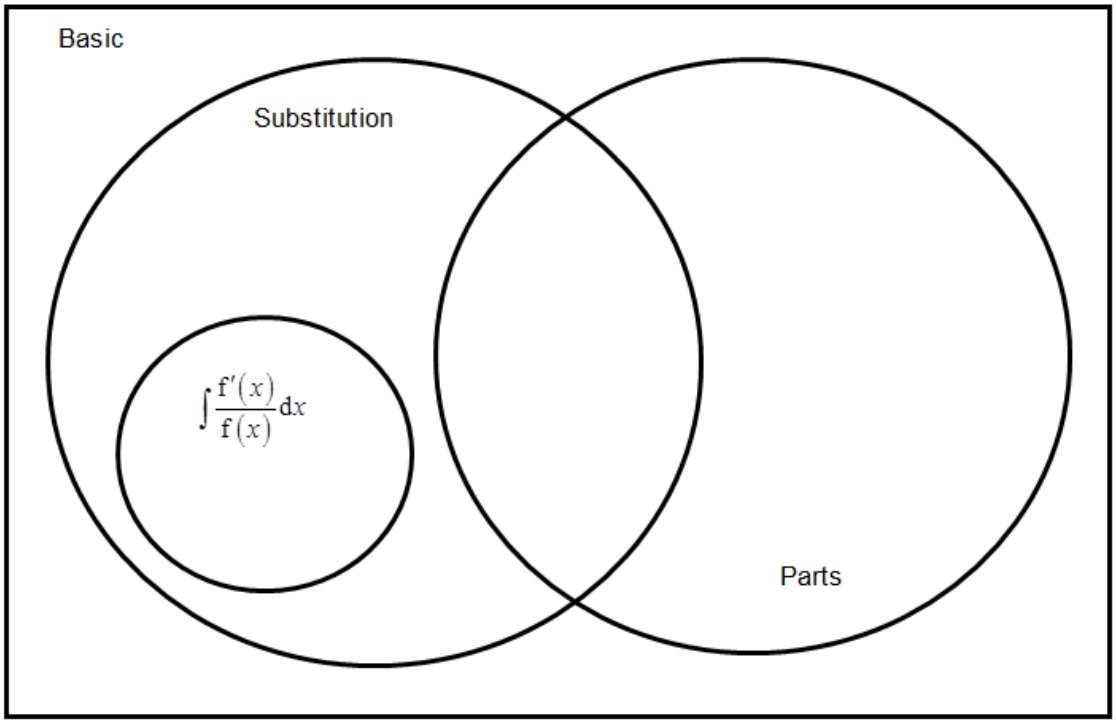
This task is concerned with choosing a suitable method for integration rather than performing the actual integration.

Students should work in pairs or small groups to place the cards below onto a large copy of the Venn diagram. Once confident they are correctly placed they should be glued in place.

The activity should generate lots of discussion about which ones can go in more than one region and about where to put any that they consider cannot be integrated using any of these methods; note that this is the case for $\int e^{x^2} dx$.

Further discussion might arise from some students deciding that, for example, $\int e^{4x} dx$ requires substitution whereas others might consider it to be a basic integration.

Students could add more cards of their own and should be encouraged to write about one from each region: explaining its position in the Venn diagram and carrying out the integration.



$\int \frac{x^2}{\sqrt{x^3+1}}\,\mathrm{d}x$	$\int \mathrm{e}^{x^2}\,\mathrm{d}x$	$\int 4\sin\tfrac{1}{2}x\,\mathrm{d}x$
$\int \frac{x^2-1}{x}\,\mathrm{d}x$	$\int \frac{1}{x^5}\,\mathrm{d}x$	$\int x(x+7)^4\,\mathrm{d}x$
$\int \frac{1}{2x+7}\,\mathrm{d}x$	$\int x^2\sin x^3\,\mathrm{d}x$	$\int x\cos 5x\,\mathrm{d}x$
$\int \frac{2x-1}{x^2-x-6}\,\mathrm{d}x$	$\int \frac{x}{x^2-4}\,\mathrm{d}x$	$\int \sin x\cos^2 x\,\mathrm{d}x$
$\int x\sqrt{3x-1}\,\mathrm{d}x$	$\int x\mathrm{e}^{x^2}\,\mathrm{d}x$	$\int x\sqrt{x+5}\,\mathrm{d}x$
$\int \frac{7}{x^2}\,\mathrm{d}x$	$\int (x+1)(x+3)^5\,\mathrm{d}x$	$\int \sin^6 x\cos x\,\mathrm{d}x$

$\int \ln x \, \mathrm{d}x$	$\int \frac{2x-1}{x+4} \, \mathrm{d}x$	$\int \sin x \cos x \, \mathrm{d}x$
$\int \mathrm{e}^{4x} \mathrm{d}x$	$\int \frac{1}{(2x+3)^4} \, \mathrm{d}x$	$\int \sqrt{2x-1} \mathrm{d}x$
$\int \frac{x}{x+1} \, \mathrm{d}x$	$\int (x+2)^6 \, \mathrm{d}x$	$\int x \mathrm{e}^{2x} \, \mathrm{d}x$
$\int \frac{4}{\mathrm{e}^{3x}} \, \mathrm{d}x$	$\int x \sin x \, \mathrm{d}x$	$\int \mathrm{e}^{2x+3} \mathrm{d}x$