Review

1) $\int_1^8 \sqrt[3]{3x-1}\,dx$

let $u = 3x-1$, $du = 3dx$, $dx = \frac{du}{3}$

$\int_1^8 u^{1/2}\frac{du}{3} = \frac{1}{3}\int_1^8 u^{1/2}\,du$

$\frac{1}{3}\frac{u^{3/2}}{3/2}\Big|_1^8 = \frac{2(3x-1)^{3/2}}{9}\Big|_1^8$

8	1
24.5120	0.6285

$24.5120 - 0.6285 = 23.8835$

2) $\int_0^{\pi} -\sin(2x)\,dx$

let $u = 2x$, $du = 2dx$, $dx = \frac{du}{2}$

$\int_0^{\pi} -\sin u \frac{du}{2} = \frac{1}{2}\int_0^{\pi} -\sin u\,du$

$\frac{1}{2}\cos u\Big|_0^{\pi}$

$\frac{1}{2}\cos 2x\Big|_0^{\pi}$

π	0
$\frac{1}{2}\cos 2\pi$	$\frac{1}{2}\cos 0$
$\frac{1}{2}$	$\frac{1}{2}$

$\frac{1}{2} - \frac{1}{2} = 0$

3) $\int (5x-7)^3\,dx$

let $u = 5x-7$ $du = 5dx$ $dx = \frac{du}{5}$

$\int u^3 \frac{du}{5} = \frac{1}{5}\int u^3\,du = \frac{1}{5}\frac{u^4}{4} = \frac{u^4}{20}$

$\frac{(5x-7)^4}{20} + C$

4) $\int x(3x^2+2)dx$

let $u = 3x^2+2$, $du = 6x\,dx$ $dx = \frac{du}{6x}$

$\int x u \frac{du}{6x} = \frac{1}{6}\int u\,du = \frac{1}{6}\frac{u^2}{2} = \frac{u^2}{12}$

$\frac{(3x^2+2)^2}{12} + C$

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

let $u = 4x^3+2$, $du = 12x^2\,dx$, $dx = \frac{du}{12x^2}$

$\int x^2 u^2 \frac{du}{12x^2} = \frac{1}{12}\int u^2\,du = \frac{1}{12}\left(\frac{u^3}{3}\right) =$

$\frac{u^3}{36} = \frac{(4x^3+2)^3}{36} + C$

6) $\int \frac{5x}{\sqrt[4]{6x^2+4}}\,dx$

let $u = 6x^2+4$, $du = 12x\,dx$, $dx = \frac{du}{12x}$

$\int \frac{5x}{u^{1/4}}\frac{du}{12x} = \frac{5}{12}\int \frac{1}{u^{1/4}}\,du = \frac{5}{12}\int u^{-1/4}\,du$

$\frac{5}{12}\left(\frac{u^{3/4}}{3/4}\right) = \frac{20}{36}u^{3/4} = \frac{20(6x^2+4)^{3/4}}{36} +$

7) $\int \sin(5x)\,dx$

let $u = 5x$, $du = 5dx$, $dx = \frac{du}{5}$

$\int \sin u \frac{du}{5} = \frac{1}{5}\int \sin u\,du = \frac{1}{5}(-\cos u)$

$\frac{-\cos 5x}{5} + C$

8) $\int 4x\cos(3x^2)\,dx$

let $u = 3x^2$, $du = 6x\,dx$, $dx = \frac{du}{6x}$

$\int 4x\cos u \frac{du}{6x}$

$\frac{2}{3}\int \cos u\,du = \frac{2}{3}\sin u =$

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