MATH 2310 Antiderivatives

$\frac{d}{dx}[k] = 0$	$\int k dx = kx + C$
$\frac{d}{dx}[x^n] = nx^{n-1}$	$\int x^n dx = \frac{x^{n+1}}{n+1} + C$ where $n \neq 1$
$\frac{d}{dx}[\ln(x)] = \frac{1}{x}$	$\int \frac{1}{x} dx = \ln(x) + C$
$\frac{d}{dx}[e^x] = e^x$	$\int ???dx =$
$\frac{d}{dx}[\sin(x)] = \cos(x)$	$\int ???dx =$
$\frac{d}{dx}[\cos(x)] = -\sin(x)$	$\int ???dx =$
$\frac{d}{dx}[\tan(x)] =$	$\int \sec^2 x dx =$
$\frac{d}{dx}[\sec(x)] =$	$\int ???dx =$
$\frac{d}{dx}[\cot(x)] =$	$\int \csc^2(x) dx =$
$\frac{d}{dx}[\csc(x)] =$	$\int \csc(x)\cot(x) dx =$
$\frac{d}{dx}\left[\sin^{-1}(x)\right] = \frac{1}{\sqrt{1-x^2}}$	$\int ???dx =$
$\frac{d}{dx}\left[\tan^{-1}(x)\right] =$	$\int ???dx =$
$\frac{d}{dx}\left[\sec^{-1}(x)\right] = \frac{1}{\lvert x\rvert\sqrt{x^2-1}}$	$\int \frac{1}{\lvert x\rvert\sqrt{x^2-1}} dx =$

Straightforward Antiderivatives.

1. $\int 3x^2 + 4x^{-3} + 2\, dx$
2. $\int 3\csc(x)\cot(x) + \frac{4}{\sqrt{1-x^2}}\, dx$
3. $\int 2\csc(x)\cot(x) + \frac{4}{\sqrt{1-x^2}}\, dx$
4. $\int -6\sin(x) + \frac{7}{3x} + \frac{7x}{3} + 5\, dx$
5. $\int 5\sec^2(x)) + \frac{4}{1+x^2}\, dx$

Use some algebra to make each a straightforward antiderivative.

1. $\int x(x^2 - 2 + \frac{1}{x} + \frac{3}{x^2})\, dx$
2. $\int \frac{1}{\sin^2(x)}\, dx$
3. $\int \frac{3x^2 + 4x^{-3} + 2}{\sqrt{x}}\, dx$

Use some u-substitutuion to make each a straightforward antiderivative.

1. $\int \cos(3x)\, dx$
2. $\int e^{5x}\, dx$
3. $\int x\cos(3x^2)\, dx$
4. $\int xe^{5x^2}\, dx$
5. $\int \frac{x^3}{x^4 + 4}\, dx$