Exercise day:

Some review: $\frac{r}{2\pi} = \frac{d}{360}$ $\nearrow d = r \cdot \frac{180}{\pi}$ $\searrow r = d \cdot \frac{\pi}{180}$ $\quad 42° =$ $\quad -\frac{2\pi}{5} =$

$P_t = (\cos t, \sin t)$ is the terminal point

$\sin(\alpha+\beta) = \sin\alpha\cos\beta + \cos\alpha\sin\beta \quad \cos(-t) = \cos t \quad \sin(-t) = -\sin t$

$\tan\left(\frac{5\pi}{12}\right) = \tan(30° + 45°) = \tan\left(\frac{\pi}{6} + \frac{\pi}{4}\right)$

define $\sec t = \frac{1}{\cos t}$, $\csc t = \frac{1}{\sin t}$, notice the following formula

$1 + \tan^2 t = 1 + \frac{\sin^2 t}{\cos^2 t} = \frac{\cos^2 t + \sin^2 t}{\cos^2 t} = \frac{1}{\cos^2 t} = \sec^2 t$

$\sec(\pi t + 2) = 2 \Rightarrow t = ?$

$(af+bg)' = af' + bg'$, $(fg)' = f'g + fg'$, $\left(\frac{f}{g}\right)' = \frac{f'g - fg'}{g^2}$, $[f(g)]' = f'(g)g'$

$(\tan t)' = \sec^2 t$, $\int_0^{\frac{\pi}{4}} \sec^2 t \, dt = \tan t \Big|_0^{\frac{\pi}{4}} = 1$

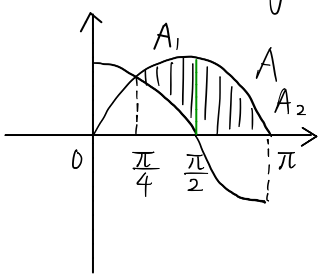
$\left(e^{3x^2}\sin(2x)\right)' = 6xe^{3x^2}\sin 2x + 2e^{3x^2}\cos 2x = e^{3x^2}(6x\sin 2x + 2\cos 2x)$

$\left(\sqrt[3]{x^2}\right)' = \left((x^2)^{\frac{1}{3}}\right)' = \left(x^{\frac{2}{3}}\right)' = \frac{2}{3}x^{-\frac{1}{3}} = \frac{2}{3\sqrt[3]{x}}$

$\int (2 + \tan^2 x)\,dx = x + \tan x + C$

$\left(\sin^4 e^{3x}\right)' = 4\sin^3 e^{3x} \cdot \cos e^{3x} \cdot 3e^{3x}$

The Area of the following



$A = A_1 + A_2 = \int_{\frac{\pi}{4}}^{\frac{\pi}{2}} (\sin x - \cos x)\,dx + \int_{\frac{\pi}{2}}^{\pi} \sin x \, dx$

$= \left[-\cos x - \sin x\right]_{\frac{\pi}{4}}^{\frac{\pi}{2}} + \left[-\cos x\right]_{\frac{\pi}{2}}^{\pi}$

$= \left[(-0-1) - \left(-\frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2}\right)\right] + \left[(-(-1)) - (-0)\right]$

$= (-1 + \sqrt{2}) + 1 = \sqrt{2}$

$\int \sin^2 x \cos x \, dx$, $\int \cos^3 x \, dx$, $\int \frac{1}{t \ln t} dt$,