6.1:

1) g) $\iint_R \frac{1}{1+x^2y}\,dx\,dy$; $R=[1,\sqrt{3}]\times[0,1]$

$$\iint_R \frac{1}{1+x^2y}\,dx\,dy = \int_1^{\sqrt{3}}\int_0^1 \frac{1}{1+x^2y}\,dy\,dx$$

bytte int. rekkefølge

$$= \int_1^{\sqrt{3}} \left[\frac{\ln(1+x^2y)}{x^2}\right]_{y=0}^{1} dx$$

$$= \int_1^{\sqrt{3}} \left(\frac{\ln(1+x^2)}{x^2} - \overbrace{\frac{\ln(1)}{x^2}}^{0}\right) dx = \int_1^{\sqrt{3}} \frac{\ln(1+x^2)}{x^2}\,dx$$

$$= \left[-\frac{\ln(1+x^2)}{x}\right]_{x=1}^{\sqrt{3}} + \int_1^{\sqrt{3}} \frac{2\cancel{x}}{(1+x^2)\cancel{x}}\,dx$$

Delvis int: $\int uv' = [uv] - \int vu'$

$u = \ln(1+x^2)$

$v' = \frac{1}{x^2}$

$$\boxed{v = -\frac{1}{x} = -x^{-1} \qquad u' = \frac{1}{1+x^2}\,2x}$$

$$= -\frac{\ln(4)}{\sqrt{3}} + \ln(2) + 2\left[\arctan(x)\right]_{x=1}^{\sqrt{3}}$$

$$= -\frac{2\ln(2)}{\sqrt{3}} + \ln(2) + 2\arctan(\sqrt{3}) - 2\arctan(1)$$

$$= \left(1-\frac{2\sqrt{3}}{3}\right)\ln(2) + \frac{2\pi}{3} - \frac{\pi}{2}$$

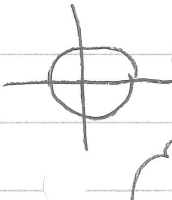
$\tan\left(\frac{\pi}{4}\right)=1$

$\arctan(1)=\frac{\pi}{4}$

$2\arctan(1)=\frac{\pi}{2}$

$$= \left(1-\frac{2\sqrt{3}}{3}\right)\ln(2) + \frac{\pi}{6}$$

$\frac{4\pi-3\pi}{6}$



$\tan\left(\frac{\pi}{3}\right)=\sqrt{3}$

$\arctan(\sqrt{3})=\frac{\pi}{3}$

$2\arctan(\sqrt{3})=\frac{2\pi}{3}$

Roten av 0 halve
Roten av 1 halve
Roten av 2 halve
...

bakleng!

	0	$\frac{\pi}{6}$	$\frac{\pi}{4}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$
sin	0	$\frac{1}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{\sqrt{3}}{2}$	1
cos	1	$\frac{\sqrt{3}}{2}$	$\frac{\sqrt{2}}{2}$	$\frac{1}{2}$	0
$\frac{\sin}{\cos}$ = tan	0	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$	ikke def.