Fasit til eksamen i MAT 1100 — Januar 2005

DEL 1

1. c) $-\frac{1}{2}\cot(x^2)+C$

2. b) $\frac{A}{x-1}+\frac{B}{(x-1)^2}+\frac{Cx+D}{x^2+2x+2}$

3. a) $x\arctan x-\frac{1}{2}\ln(1+x^2)+C$

4. e) $\frac{xz}{\sqrt{1-x^2y^2}}$

5. d) $(6,3,3)$

6. d) $(1,-1)$

7. c) sadelpunkt

8. a) $\int_0^1 \frac{\sqrt{x^4+2x^2+2}}{1+x^2}\,dx$

9. e) $\frac{\arctan(\sqrt{x})}{2x}$

10. d) $2x^5y^7e^{xy^2}+6x^4y^5e^{xy^2}$

DEL 2

Oppgave 1:

a) Den konjugerte $1-i\sqrt{3}$ er også en rot.

b)

$$z^4+4z^2+16=(z^2-2z+4)(z^2+2z+4)=$$
$$=(z-(1+i\sqrt{3}))(z-(1-i\sqrt{3}))(z-(-1+i\sqrt{3}))(z-(-1-i\sqrt{3}))$$

Oppgave 2:

a) $\frac{1}{2}\ln(u^2+2u+5)+\frac{1}{2}\arctan\frac{u+1}{2}+C$

b) $A=\frac{1}{5}$, $B=-\frac{1}{5}$, $C=-\frac{2}{5}$.

c) $\frac{1}{5}\ln|\cos x|-\frac{1}{10}\ln(\cos^2 x+2\cos x+5)-\frac{1}{10}\arctan(\frac{\cos x+1}{2})+C$

Oppgave 3:

$3+\sqrt{3}$.