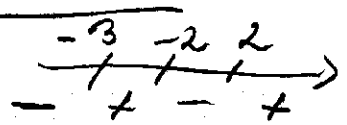
SVAR BI/KS 22/8 - 2012

(1a) $\frac{1}{2(x+y)}$ (1b) $\frac{x-1}{x-2}$

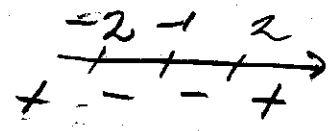
(2a) $2x^2=(x-1)(1+3x)$ $x^2-2x-1=0$ $x=1\pm\sqrt{2}$

(2b) $4x^2-4x+1=x+5/2$ $x^2-\frac{5}{4}x-\frac{3}{8}=0$ $x=\frac{5}{8}\pm\sqrt{\frac{49}{8^2}}$

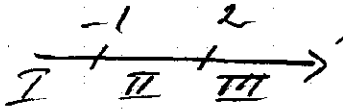
$x=-1/4$

(3a) 

$x<-3$ eller $-2<x<2$

(3b) $\frac{(x+1)^2}{x^2-4}>0$ 

$x<-2$ eller $x>2$

(4) 

I: $x(2-x)=2+x+1$
$x^2-x+3=0$ saknar lösn.

II: $x(2-x)=2-x-1$ $x^2-3x+1=0$ $x=\frac{3-\sqrt{5}}{2}$

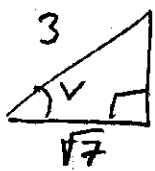
III: $x(x-2)=2-x-1$ $x^2-x-1=0$ $x=(1\pm\sqrt{5})/2$ ∉ III

(5a) $\ln 2(x-3)=\ln\sqrt{x}$ $\sqrt{x}=t$ $t^2-\frac{1}{2}t-3=0$

$t=\frac{1}{4}\pm\frac{7}{4}$ $t=2$ $x=4$

(5b) $(3^x)^2-3\cdot3^x+2=0$ $3^x=\frac{3}{2}\pm\sqrt{\frac{9}{4}-2}=\frac{3\pm1}{2}$

$3^x=2$ el. $3^x=1$ $x=\frac{\ln 2}{\ln 3}$ el. $x=0$

(6a) 

$\cos v=\frac{\sqrt{7}}{3}$

(6b) $\cos(2v)=\cos(\frac{\pi}{2}-v)$ $2v=\pm(\frac{\pi}{2}-v)+n2\pi$

$v_1=\frac{\pi}{6}+n\frac{2\pi}{3}$ el. $v_2=-\frac{\pi}{2}+n2\pi$
(v_2 inkluderad i v_1)

(6c) $1-\sin^2 v = \frac{2}{\sqrt{3}}\sin v \qquad \sin(v) = -\frac{1}{\sqrt{3}} \pm \sqrt{\frac{1}{3}+1}$

$\sin(v) = 1/\sqrt{3} \qquad = \frac{-1 \pm 2}{\sqrt{3}}$

(7a) $y-1 = \frac{1-3}{-2-(-5)}(x+2) \qquad y = -\frac{2x}{3} - \frac{1}{3}$

(7b) $3((x+1)^2-1) + 2\left((y-\tfrac{1}{4})^2 - \tfrac{1}{16}\right) = 0$

$3(x+1)^2 + 2(y-1/4)^2 = \frac{25}{8}$

$\frac{(x+1)^2}{\frac{25}{24}} + \frac{(y-1/4)^2}{\frac{25}{16}} = 1$ centr $(-1, \frac{1}{4})$ halvaxlar $\frac{5}{\sqrt{24}}$, $\frac{5}{4}$

(7c) $(x+2)^2 + (y-1)^2 = 10 \qquad y = 3x+1$

$x^2 + 4x + 4 + 9x^2 = 10 \qquad x^2 + \frac{2x}{5} - \frac{3}{5} = 0$

$x = -\frac{1}{5} \pm \sqrt{\frac{1}{25} + \frac{3}{5}} = \frac{-1 \pm 4}{5}$ $(-1, -2)$ $(3/5, 14/5)$

(8a) $f'(x) = \frac{2x(x+1) - x^2 \cdot 1}{(x+1)^2} = \frac{x^2+2x}{(x+1)^2}$

$f'(x) = 0 \Leftrightarrow x = 0$ el. $x = -2$

(8b) $y - f(1) = f'(1)(x-1)$

$y - \frac{1}{2} = \frac{3}{4}(x-1) \qquad y = \frac{3x}{4} - \frac{1}{4}$