Svar Matte intro/del A BY/K1 21/10 -2011

1a $2(x-y)$ 1b $-\sqrt{ab}$

2a $x=(1-2x)(2-3x)$ $6x^2-8x+2=0$

$x=\frac{2}{3}\pm\sqrt{\frac{4}{9}-\frac{1}{3}}$ $x_1=1$ $x_2=\frac{1}{3}$

2b $4x^2+4x+1=2x^2-3x+5$ $2x^2+7x-4=0$

$x=-\frac{7}{4}\pm\sqrt{\frac{49}{16}+2}=\frac{-7\pm 9}{4}$ $x=-4$

3a $-2 \quad 2 \quad 3$

$+ \quad - \quad + \quad -$ $-2<x<2$ eller $x>3$

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

$-1 \quad 0 \quad 1 \quad 2$

$+ \quad - \quad + \quad - \quad +$ $-1<x<0$ eller $1<x<2$

4 $-1 \quad 3$

$I \quad II \quad III$

I: $-(x+1)=-2x+6+3$ $x=10\notin I$

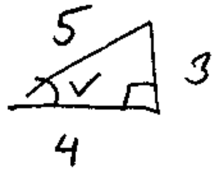
II: $x+1=-2x+6+3$ $\underline{x=\frac{8}{3}\in II}$

III: $x+1=2x-6+3$ $\underline{x=4\in III}$

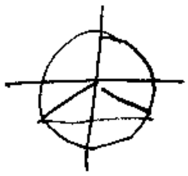
5a $\ln(3x)=\ln(6(2x)^3)$ $3x=6(2x)^3$ $x=2^{-2}$

5b $\begin{cases}5=Ae^{k}\\3=Ae^{2k}\end{cases}\Rightarrow e^{k}=\frac{3}{5}$ $k=\ln\frac{3}{5}$ $A=\frac{5}{e^{k}}=\frac{25}{3}$

$x=4\Rightarrow y=Ae^{4k}=\frac{25}{3}\left(\frac{3}{5}\right)^4=\frac{27}{25}$

6a 

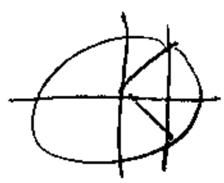
$\cos\left(v+\frac{\pi}{4}\right) = \frac{4}{5}\frac{1}{\sqrt{2}} - \frac{3}{5}\cdot\frac{1}{\sqrt{2}} = \frac{1}{5\sqrt{2}}$

6b 

$2v - \frac{\pi}{3} = -\frac{\pi}{4} + n2\pi \quad v = \frac{\pi}{24} + n\pi$

$2v - \frac{\pi}{3} = -\frac{3\pi}{4} + n2\pi \quad v = -\frac{5\pi}{24} + n\pi$

6c $2\cos^2 v - 1 + 3\cos v = 1 \quad \cos v = x \quad x = -\frac{3}{4} \pm \sqrt{\frac{9}{16}+1}$

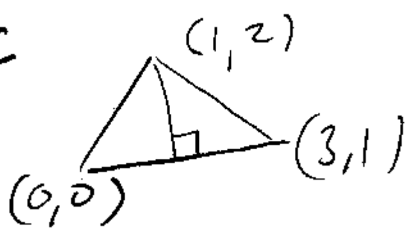
$x = \frac{1}{2}$  $v = \pm\frac{\pi}{3} + n2\pi$

7a $y = \frac{7}{2}x - 2$

7b $2\left((x-1)^2 - 1\right) + 4\left(\left(y+\frac{5}{8}\right)^2 - \frac{25}{64}\right) = -3$

$2(x-1)^2 + 4\left(y+\frac{5}{8}\right)^2 = \frac{9}{16}$ centr $\left(1, -\frac{5}{8}\right)$

$\frac{(x-1)^2}{\frac{1}{2}\cdot\frac{9}{16}} + \frac{(y+5/8)^2}{\frac{1}{4}\cdot\frac{9}{16}} = 1$ halvaxlar $\frac{1}{\sqrt{2}}\cdot\frac{3}{4}, \frac{1}{2}\cdot\frac{3}{4}$

7c 

$\frac{x}{3} = -3(x-1) + 2 \quad x = \frac{3}{2} \; y = \frac{1}{2}$

höjd $= \sqrt{\left(1-\frac{3}{2}\right)^2 + \left(2-\frac{1}{2}\right)^2} = \sqrt{\frac{5}{2}}$

8a $f'(x) = -\frac{2}{x^4} - \frac{1}{x^2} + 1 = \frac{x^4 - x^2 - 2}{x^4}$

$x^2 = t \quad t = \frac{1}{2} \pm \sqrt{\frac{1}{4}+2} \quad t = 2 \quad x = \pm\sqrt{2}$

8b $f(1) = 8/3 \quad f'(1) = -2$

tgt: $y = -2(x-1) + 8/3 = -2x + 14/3$

norm: $y = \frac{1}{2}(x-1) + 8/3 = \frac{x}{2} + \frac{13}{6}$