Matte intro/del A BE/KE 22/10-2010

1a) $xy^{4/3-2} = xy^{-2/3}$ b) $x+y$ c) $\frac{x-1+2}{2(x-1)(x+1)} = \frac{1}{2(x-1)}$

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

b) $4-4x+x^2 = 2x^2+1$ $x = -2 \pm \sqrt{4+3}$ $x = -2-\sqrt{7}$

3a) $x = \frac{3}{4} \pm \sqrt{\frac{9}{16}+\frac{1}{2}} = \frac{3\pm 1}{4}$ $x \le \frac{1}{2}$ eller $x \ge 1$

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

4) $\pm 1, \pm 2, \pm 1/2$

$$\begin{array}{r} 2x^2+8x+4 \\ x-1/2 \overline{)\,2x^3+7x^2-2} \\ -(2x^3-x^2) \\ \hline 8x^2-2 \\ -(8x^2-4x) \\ \hline 4x-2 \\ -(4x-2) \\ \hline 0 \end{array}$$

$2x^2+8x+4=0$

$x = -2 \pm \sqrt{4-2}$

Fakt:

$2(x-\frac{1}{2})(x-(-2+\sqrt{2}))(x-(-2-\sqrt{2}))$

5a) $\ln\left(\frac{(\sqrt{x})^4 \cdot x^2}{x^3}\right) = \ln 2$

$\ln x = \ln 2$

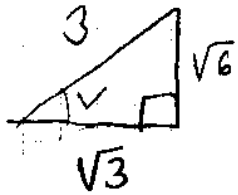
$x = 2$

5b) $t = e^x$ $t^2-t-6=0$

$t = \frac{1}{2} \pm \sqrt{\frac{1}{4}+6} = \frac{1\pm 5}{2}$

$x = \ln t = \ln 3$

6a)



$\tan v = \sqrt{2}$

6b) $\sin(2v+\pi) = -1$

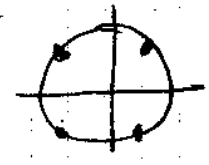
$2v+\pi = -\frac{\pi}{2} + n2\pi$

$v = -\frac{3\pi}{4} + n\pi$

(eller $\sin(2v) = 1 \Leftrightarrow 2v = \frac{\pi}{2} + n2\pi$ $v = \frac{\pi}{4} + n\pi$)

6c) $1-\cos^2 v + 2\cos^2 v = \frac{3}{2}$

$\Leftrightarrow \cos v = \pm\frac{1}{\sqrt{2}}$



$\begin{cases} v = \pm\frac{\pi}{4} + n2\pi \\ v = \mp 3\pi/4 + n2\pi \end{cases}$

(eller $v = \frac{\pi}{4} + n\frac{\pi}{2}$)

7a) $k = \frac{-1}{-\frac{1}{2}} = 2 \Rightarrow y - 1 = 2(x-3)$

$y = 2x - 5$

7b) $(x-1)^2 + (y+3/2)^2 = 1+1+\frac{9}{4} \Rightarrow$ medelpkt $= (1, -\frac{3}{2})$

$\Rightarrow$ Linje: $\frac{y-2}{x-3} = \frac{-\frac{3}{2}-2}{1-3} \Leftrightarrow y - 2 = \frac{7}{4}(x-3)$

7c) $3((x-1)^2 - 1) + (y+\frac{1}{2})^2 - \frac{1}{4} = \frac{3}{4} \Leftrightarrow 3(x-1)^2 + (y+\frac{1}{2})^2 = 4$

$\Leftrightarrow \frac{(x-1)^2}{\frac{4}{3}} + \frac{(y+1/2)^2}{4} = 1 \Rightarrow$ medelpkt $(1, -1/2)$

halvaxlar $\frac{2}{\sqrt{3}}, 2$

8) $f'(x) = \frac{1}{2\sqrt{x}} - 4x \quad f'(1) = -\frac{7}{2} \Rightarrow$ tgt: $y + 1 = -\frac{7}{2}(x-1)$

$y = 0 \Rightarrow x = 1 - \frac{2}{7}$

$\frac{1}{2\sqrt{x}} = 4x \Leftrightarrow \frac{1}{8} = x\sqrt{x} \Leftrightarrow (2^{-3})^{2/3} = x \Leftrightarrow \frac{1}{4} = x$