Oblig 1 Lösningsförslag

① a) $-3^2 - 2(5-2^2)^2 = -9 - 2(1)^2 = \underline{\underline{-11}}$

b) $\sqrt{2} \cdot \sqrt{18} = \sqrt{2 \cdot 18} = \sqrt{36} = \underline{\underline{6}}$

c) $$\frac{(2x^{-3}y^2)^3}{2^2(x^5y^{-3})^{-2}} = \frac{2^3 x^{-9} y^6}{2^2 x^{-10} y^6}$$

$$= 2^{3-2} x^{-9+10} y^{6-6}$$

$$= \underline{\underline{2x}}$$

d) $$\frac{6{,}2 \cdot 10^{-17}}{2{,}0 \cdot 10^{-27}} = 3{,}1 \cdot 10^{-17+27} = \underline{\underline{3{,}1 \cdot 10^{10}}}$$

e) $$\frac{\sqrt{a} \cdot \sqrt[4]{a}}{\sqrt[3]{a^2}} = \frac{a^{\frac{1}{2}} \cdot a^{\frac{1}{4}}}{a^{\frac{2}{3}}} = a^{\frac{6}{12}+\frac{3}{12}-\frac{8}{12}}$$

$$= a^{\frac{1}{12}} = \underline{\underline{\sqrt[12]{a}}}$$

f) $3(x-2)(x-3) - 5(x-1)(x-2)$

$= (x-2)(3(x-3) - 5(x-1))$

$= (x-2)(3x-9-5x+5)$

$= (x-2)(-2x-4)$

$= -2(x-2)(x+2)$

$= -2(x^2-4)$

$= \underline{\underline{-2x^2+8}}$

FN

2x

g) $\frac{2}{x} - \frac{x}{2} + \frac{3}{2x}$

$= \frac{4}{2x} - \frac{x^2}{2x} + \frac{3}{2x}$

$= \frac{7 - x^2}{2x}$

(2) I $3x + 2y = 7$

II $x + 3y = 7$

II $x = 7 - 3y$

II i I) $3(7 - 3y) + 2y = 7$

$21 - 9y + 2y = 7$

$-7y = 7 - 21$

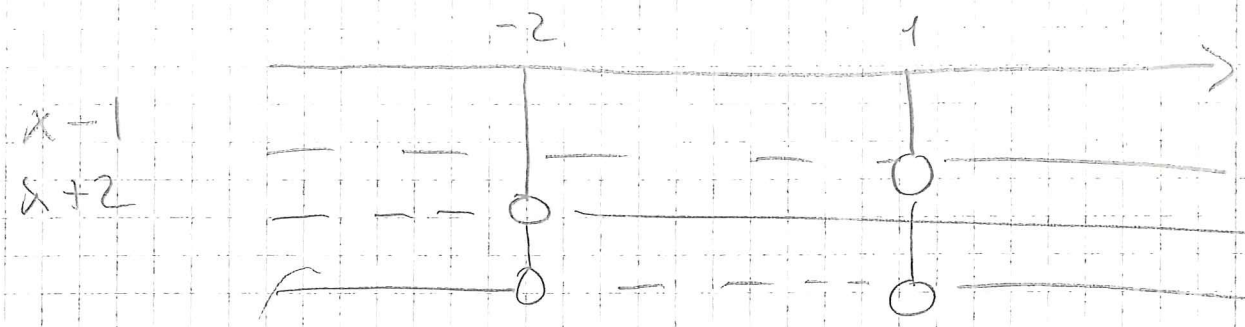
$-7y = -14$ /:-7

$y = 2$

II) $x = 7 - 3 \cdot 2 = 7 - 6 = 1$

$x = 1$ oqy $= 2$

(3) a) $(x-1)(x+2) > 0$



$(x-1)(x+2) > 0$ for $x \in \langle -\infty, -2 \rangle \cup \langle 1, \infty \rangle$

b) $\frac{2}{3}x + 3 > \frac{3x}{2} - \frac{1}{3} \quad / \cdot 6$

$4x + 18 > 9x - 2$

$4x - 9x > -2 - 18$

$-5x > -20 \quad / : -5$

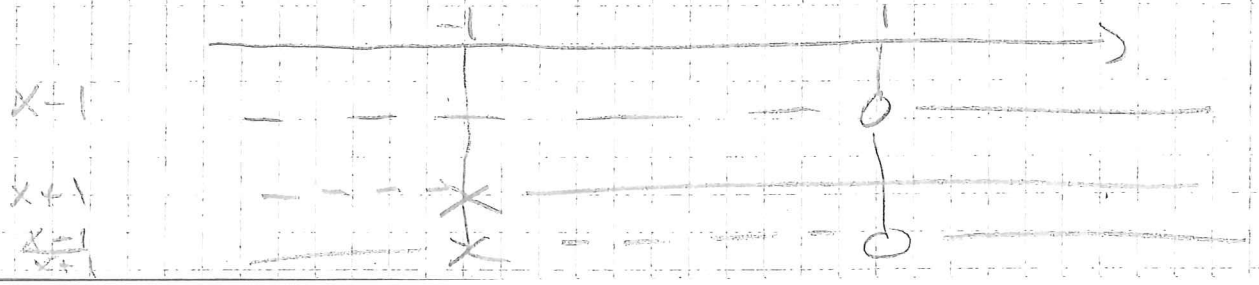
$x < 4$

c) $\frac{2x}{x+1} < 1$

$\frac{2x}{x+1} - \frac{x+1}{x+1} < 0$

$\frac{2x - x - 1}{x+1} < 0$

$\frac{x-1}{x+1} < 0$



$\frac{2x}{x+1} < 1$ for $x \in \langle -1, 1 \rangle$

(4)

a) $\frac{2x^2-8}{2x+8} : \frac{3x+6}{x+4}$

$= \frac{2(x^2-4)}{2(x+4)} \cdot \frac{x+4}{3(x+2)}$

$= \frac{(x+2)(x-2)(x+4)}{(x+4) \cdot 3 \cdot (x+2)} = \frac{x-2}{3}$

b) $x^2 - 3x + 2$

$= (x-2)(x-1)$

c) $x(x-3) = 0$

$x = 0 \quad \vee \quad x - 3 = 0$

$x = 0 \quad \vee \quad x = 3$

d) $\frac{x^3 + 4x^2 + 4x}{x^2 + 2x}$

$= \frac{x(x^2 + 4x + 4)}{x(x+2)}$

$= \frac{x(x+2)^2}{x(x+2)} = x+2$

e) $\frac{3}{2}(x-1) - \frac{2}{3}(1-x) = \frac{5}{2}x$ /·6

$9(x-1) - 4(1-x) = 15x$

$9x - 9 - 4 + 4x = 15x$

$13x - 15x = 13$

$-2x = 13$

$x = -\frac{13}{2}$

f) $2x^3 - 5x^2 + x + 2 : x - 1 = 2x^2 - 3x - 2$

$-(2x^3 - 2x^2)$

$-3x^2 + x + 2$

$-(-3x^2 + 3x)$

$-2x + 2$

$-2x + 2$

0

(5) $(-2, 1)$ og $(2, 3)$

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

$y - y_1 = a(x - x_1)$

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

$y = \frac{1}{2}x + \frac{1}{2} \cdot 2 + 1$

$= \frac{1}{2}x + 2$

6) a) $f(0) = \underline{-3}$ b) $f(-1) = \underline{-4}$

c) $f(x) = 0 \iff x = -3 \vee x = 1$

d) $V_f = [-4, \rightarrow\rangle$

7) $h(t) = 120 + 42t - 4,9t^2$

a) $h(2,2) = 120 + 42 \cdot 2,2 - 4,9 \cdot (2,2)^2$

$\approx \underline{189 \text{ m}}$

b) $h(0) = \underline{120 \text{ m}}$

c) $120 + 42t - 4,9t^2 = 180$

$-4,9t^2 + 42t - 60 = 0$

$t = 1,8 \quad \vee \quad t = 6,76$

etter $\underline{1,8 \text{ s og } 6,8 \text{ s}}$

d) Løser grafisk på kalkulator
finner $t = 4,3$ i maksimalpunkt

$h(4,3) = 120 + 42 \cdot 4,3 - 4,9 \cdot 4,3^2 = \underline{210 \text{ m}}$