MA0001 - Øving nr 1 Gruppe 4

Magnus L. Holtet

1

a)

$$x^{-5}\,x^{6}$$

$$x^{-5+6}$$

$$x$$

b)

$$\frac{(x^2yz)^3}{x^4y^3z^5}$$

$$= \frac{(x^2yz)(x^2yz)(x^2yz)}{x^4y^3z^5}$$

$$= \frac{x^6y^3z^3}{x^4y^3z^5}$$

$$= \frac{x^2}{z^2}$$

c)

$$\frac{e^{x-y}}{e^x e^y}$$

$$= \frac{e^x \cdot e^{-y}}{e^x \cdot e^y}$$

$$= \frac{e^{-y}}{e^y}$$

$$= e^{-y} \cdot e^{-y}$$

$$= \underline{\underline{e^{-2y}}}$$

d)

$$\frac{x^2 - y^2}{x+y}$$

$$= \frac{(x-y)(x+y)}{x+y}$$

$$= \underline{\underline{x-y}}$$

2

a)

$$1 + 2x = 2 + x$$

$$\underline{\underline{x = 1}}$$

b)

$$x^2 + x = 1$$

$$= x^2 + x - 1 = 0$$

$$= \frac{-1 \pm \sqrt{1^2 - 4 \cdot 1 \cdot -1}}{2 \cdot 1}$$

$$= \frac{-1 \pm \sqrt{5}}{2}$$

$$= \underline{\underline{x_1 = \frac{\sqrt{5} - 1}{2}}}$$

$$\underline{\underline{x_2 = \frac{-\sqrt{5} - 1}{2}}}$$

c/ $3x(x-2)(5x+4)=0$

$(3x^2-6x)(5x+4)=0$

$= 15x^3+12x^2-30x^2-24x=0$

$= 15x^3-18x^2-24x=0$

$= x(15x^2-18x-24)=0$

$= \dfrac{18\pm\sqrt{18^2-4\cdot 15\cdot -24}}{30}$

$= \dfrac{18\pm\sqrt{1764}}{30}$

$= \dfrac{18\pm 42}{30}$

$=$

$x_1 = 0$

$x_2 = \dfrac{18+42}{30} = 2$

$x_3 = \dfrac{18-42}{30} = \dfrac{-24}{30} = -\dfrac{4}{5}$

d)

$$\frac{x}{x+1} = \frac{1}{2} + \frac{x-1}{2} \quad \Big| \cdot 2(x+1)$$

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

$$2x = x+1 + x^2 + x - x - 1$$

$$-x^2 + x = 0$$

$$x(-x+1) = 0$$

$$x_1 = 0 \qquad x_2 = 1$$

3

a)

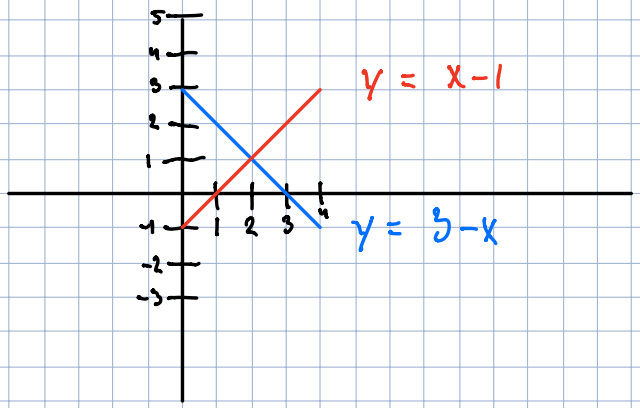
$$3 - x = x - 1$$

$$2x = 4$$

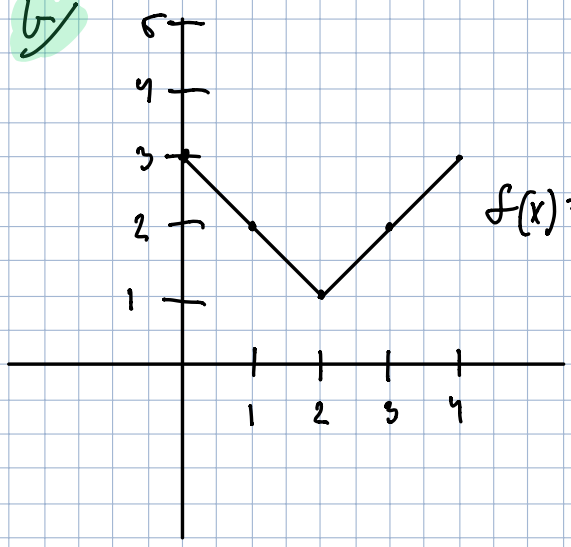
$$x = 2$$

$$y = 3 - 2 = 1$$

Linjene skjærer hverandre i (2,1)



b/



$f(x) = |x-2| + 1$