

MATTE - A ÖVNING 1 Math (2h)

1a)

$$-135^\circ$$

$$\frac{\text{grader}}{180^\circ} \cdot \pi = \text{radianer}$$

$$\frac{-135^\circ}{180^\circ} \cdot \pi = r$$

$$\frac{-3 \cdot 45}{4 \cdot 45} \cdot \pi = r = \underline{\underline{-\frac{3}{4}\pi}}$$

b)

$$\frac{\text{grader} \cdot \pi}{180^\circ} = r$$

$$\text{grader} = \frac{r \cdot 180^\circ}{\pi} = \frac{1,5\pi \cdot 180^\circ}{\pi} = \underline{\underline{270^\circ}}$$

c)

$$\sin\left(-\frac{\pi}{2}\right) = \underline{\underline{-1}}$$

2a)

$$2^3 - 3^2 \Leftrightarrow 8 - 9 \Leftrightarrow \underline{\underline{-1}}$$

b)

$$\log_4(4^2) = 2 \cdot \log_4(4) = \underline{\underline{2}}$$

c)

$$\ln(e^5) = \underline{\underline{5}}$$

3a)

$$1^{-1} + 2^{-1} + 3^{-1}$$

$$\Downarrow$$

$$\frac{1}{1} + \frac{1}{2} + \frac{1}{3} =$$

$$\Downarrow$$

$$\frac{6}{6} + \frac{3}{6} + \frac{2}{6} = \underline{\underline{\frac{11}{6}}}$$

b)

$$x^{-7} x^6$$

$$\Downarrow$$

$$\frac{x^{-7}}{x^{-6}}$$

$$\Downarrow$$

$$\underline{\underline{\frac{1}{x}}}$$

c)

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

$$\frac{7 \cdot x^4 y^6 z^4}{7 \cdot x^4 y^3 z^5}$$

$$\Downarrow$$

$$\underline{\underline{\frac{z}{y}}}$$

$$x \neq y \neq z \neq 0$$

3 d)

$$\frac{e^z \cdot x}{e^x \cdot e^z}$$

$$\frac{e^z \cdot e^{-x}}{e^x \cdot e^z} = \underline{\underline{e^{-2x}}}$$

e)

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

$$\frac{(z+y)(z-y)}{z+y} = \underline{\underline{z-y}}$$

y)

$$3 + 2x = 2 - x$$

$$3x = -1$$

$$x = \underline{\underline{-\frac{1}{3}}}$$

$$6 \quad x^2 + x = 3$$

$$x^2 + x - 3 = 0$$

$$x = \frac{-1 \pm \sqrt{1 - 4 \cdot 1 \cdot (-3)}}{2 \cdot 1}$$

$$x = \frac{-1 \pm \sqrt{13}}{2}$$

$$\underline{\underline{x = \frac{-1 - \sqrt{13}}{2}}} \quad \wedge \quad \underline{\underline{x = \frac{-1 + \sqrt{13}}{2}}}$$

d)

$$-x(x+2)(5x+4) = 0$$

$$-x = 0$$

$$\Downarrow$$

$$\underline{\underline{x = 0}}$$

$$x+2 = 0$$

$$\Downarrow$$

$$\wedge \quad \underline{\underline{x = -2}}$$

$$5x+4 = 0$$

$$5x = -4$$

$$\wedge \quad \underline{\underline{x = -\frac{4}{5}}}$$

d)

$$\frac{x}{x+1} = \frac{1}{3} + \frac{x-1}{3} \quad | \cdot 3(x+1)$$

$$3x = x+1 + (x-1)(x+1)$$

$$3x = x+1 + x^2 - 1$$

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

$$x(x-2) = 0$$

$$\underline{\underline{x = 0}} \quad \wedge \quad \underline{\underline{x = 2}}$$

5a)

$$f(x) = y = 3 - x$$

$$g(x) = y = x - 1$$

$$y = 3 - x$$

$$+ y = -1 + x +$$

$$2y = 2$$

$$y = 1$$

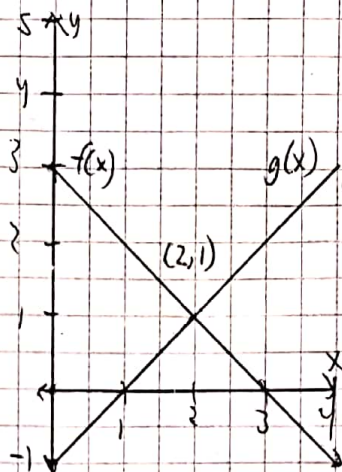
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$$y = 3 - x$$

$$-2 = -x$$

$$x = 2$$

$$P(2, 1)$$



$$f(0) = 3$$

$$f(3) = 0$$

$$g(0) = -1$$

$$g(1) = 0$$

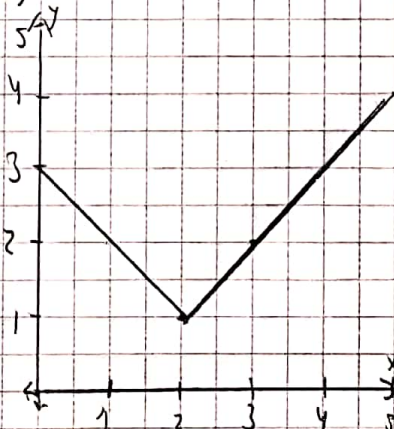
b)

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

$$x - 2 = 0$$

$$x = 2$$

$$f(x) = \begin{cases} x - 2 + 1 \rightarrow x - 1 & \text{für } x \geq 2 \\ -x + 2 + 1 \rightarrow -x + 3 & \text{für } x < 2 \end{cases}$$



$$f(0) = 3$$

$$f(1) = 2$$

$$f(2) = 1$$

$$f(3) = 2$$