Oppgave 1.

$$\frac{x}{2} \geq 1 + \frac{4}{x}$$

$$\frac{x}{2} \geq 1 + \frac{4}{x} \quad | \cdot 2$$

$$x \geq 2 + \frac{8}{x}$$

$$x - \frac{8}{x} - 2 \geq 0$$

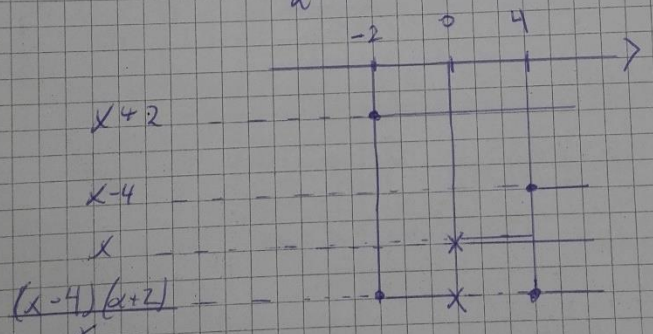
$$\frac{x^2}{x} - \frac{8}{x} - \frac{2x}{x} \geq 0$$

$$\frac{x^2 - 2x - 8}{x} \geq 0$$

$$\frac{-(-2) \pm \sqrt{2^2 - 4 \cdot 1 \cdot (-8)}}{2 \cdot 1} = \frac{2 \pm \sqrt{36}}{2} = \frac{2 \pm 6}{2}$$

$$x = \frac{2+6}{2} = \frac{4}{} \qquad x = \frac{2-6}{2} = \frac{-2}{}$$

$$\frac{(x-4)(x+2)}{x} \geq 0$$



$$x \in [-2, 0) \cup [4, \infty)$$

oppgave 2.

$|3x-7|<2$

$-2<3x-7<2$

I)

$-2<3x-7$

$-2+7<3x$

$5<3x$

$x>\frac{5}{3}$

II)

$3x-7<2$

$3x<2+7$

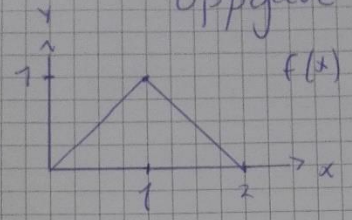
$3x<9$

$x<3$

Ser at $\frac{5}{3}<x<3$

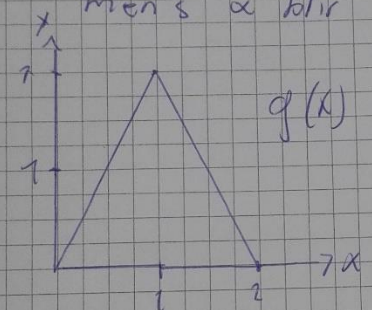
Punkt: $(\frac{5}{3}, 3)$

Oppgave 3



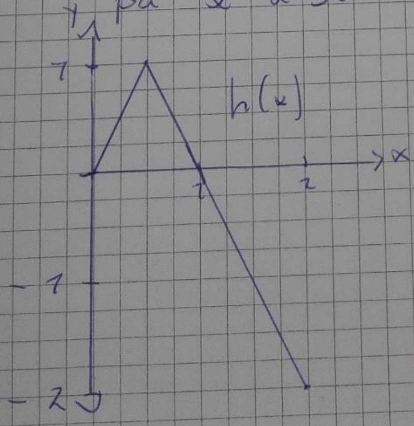
a) $g(x) = 2f(x)$

fordi f blir dobbelt så stor mens x blir upåvirka

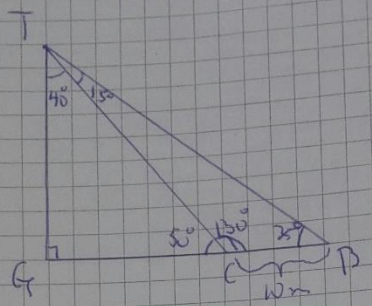


b) $h(x) = f(2x)$

verdien av x dobbles og vil derfor halverast kor langt me må komma på x-aksen for same verdi av x



oppgave 4



$\angle TCB = 180° - 150° = 130°$

$\angle BTC = 180° - 130° - 35° = 15°$

$$\frac{CB}{\sin CTB} = \frac{TC}{\sin CBT}$$

$$\frac{10\,m}{\sin 15°} = \frac{x}{\sin 35°} \Rightarrow x = \frac{10m \cdot \sin 35°}{\sin 15°}$$

$x = 22,1613m$

$\angle CTG = 180° - 90° - 50° = 40°$

$$\frac{TG}{\sin GCT} = \frac{TC}{\sin TGC}$$

$$\frac{x}{\sin 50°} = \frac{22,1613m}{\sin 90°} \Rightarrow x = \frac{22,1613m \cdot \sin 50°}{\sin 90°}$$

$x = 16,9765m \approx 17m$

masta er 17m lang

oppgave 5.

$$\frac{(1+2i)(2-3i)}{(2-i)(3+2i)}$$

$$\frac{2-3i+4i-6i^2}{6+4i-3i-2i^2}$$

$$\frac{2+i-6\cdot(-1)}{6+i-2\cdot(-1)}$$

$$\frac{2+i+6}{6+i+2}$$

$$\frac{8+i}{8+i} = \underline{\underline{1}}$$

oppgave 6.

$\theta = 270^\circ = \frac{3\pi}{2}$

$n = 3$

$w_1 = 8^{\frac{1}{3}}\left(\cos\frac{\frac{3\pi}{2}}{3} + i \cdot \sin\frac{\frac{3\pi}{2}}{3}\right)$

$\theta_1 = \frac{\frac{3\pi}{2}}{3} \cdot 2 = \frac{3\pi}{6} = \frac{\pi}{2}$

$w_1 = 2\left(\cos\frac{\pi}{2} + i \cdot \sin\frac{\pi}{2}\right) = 2(0 + i \cdot 1) = 2i$

$w_2 = 2\left(\cos\left(\frac{\frac{3\pi}{2} + 2\pi}{3}\right) + i \cdot \sin\left(\frac{\frac{3\pi}{2} + 2\pi}{3}\right)\right)$

$\theta_2 = \frac{\frac{3\pi}{2} + 2\pi}{3} = \frac{\frac{3\pi}{2} + \frac{4\pi}{2}}{3} = \frac{\frac{7\pi}{2}}{3} \cdot 2 = \frac{7\pi}{6}$

$w_2 = 2\left(\cos\frac{7\pi}{6} + i \cdot \sin\frac{7\pi}{6}\right) =$

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

$w_3 = 2\left(\cos\left(\frac{\frac{3\pi}{2} + 4\pi}{3}\right) + i \cdot \sin\left(\frac{\frac{3\pi}{2} + 4\pi}{3}\right)\right)$

$\theta_3 = \frac{\frac{3\pi}{2} + 4\pi}{3} = \frac{\frac{3\pi}{2} + \frac{8\pi}{2}}{3} = \frac{\frac{11\pi}{2}}{3} \cdot 2 = \frac{11\pi}{6}$

$w_3 = 2\left(\cos\frac{11\pi}{6} + i \cdot \sin\frac{11\pi}{6}\right) =$

$2\left(\frac{\sqrt{3}}{2} + i \cdot \left(-\frac{1}{2}\right)\right) = \sqrt{3} - i$

$w_1 = 2i, \quad w_2 = -\sqrt{3} - i, \quad w_3 = \sqrt{3} - i$