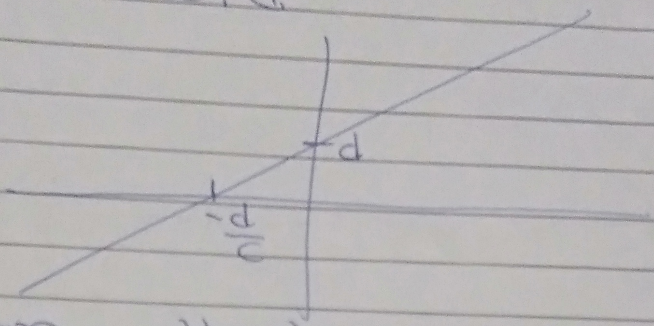
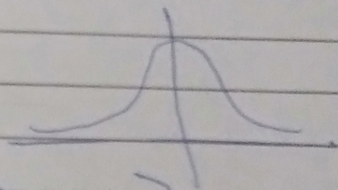
6

$$I(x) = cx+d$$



zeromeanguassian with sd = σ

$$G(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-x^2/2\sigma^2}$$



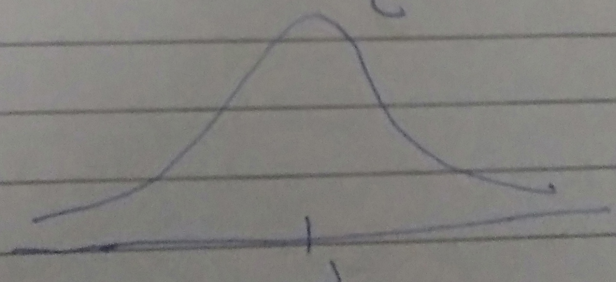
$$\cancel{J(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-x^2/2\sigma^2} \times [(cx+d)]}$$

$$J(x) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{-\frac{(cx+d)^2}{2\sigma^2}}$$

$$J(x) = \frac{1}{\sqrt{\frac{2\pi\sigma^2}{c^2} \times c^2}} e^{-\frac{\left(x-\left(-\frac{d}{c}\right)\right)^2}{\frac{2\sigma^2}{c^2}}}$$

guassian fiter with mean at $-\frac{d}{c}$ & variance of $\frac{\sigma}{c}$

& scaled by $\frac{1}{c}$ $\qquad$ $J(x)$



Subject ______

Date: __/__/__

MON TUE WED THR FRI SAT SUN

$$\left.\frac{\text{Num}}{\text{Den}}\right|_{x_1} = \frac{\int_{-\infty}^{\infty} G_{\sigma_s}(x_1-x_2)\, G_{\sigma_r}(cx_1+d-(cx_2+d))\, I(x_2)\, dx_2}{\int G_{\sigma_s}(x_1-x_2)\, G_{\sigma_r}(cx_1+d-(cx_2+d))\, dx_2}$$

$$\cancel{= \frac{\int_{-\infty}^{\infty} \exp\left(\frac{-(c^2+1)(x_1-x_2)^2}{4\sigma_s^2\sigma_r^2}\right)}{\int_{-\infty}^{\infty} \exp\left(\frac{-(c^2+1)(x_1-x_2)^2}{4\sigma_s^2\sigma_r^2}\right) dx_2}}$$

$$\frac{\int_{-\infty}^{\infty} \exp\left(-\frac{(x_1-x_2)^2}{2}\left[\frac{1}{\sigma_s^2}+\frac{c^2}{\sigma_r^2}\right]\right)(cx_2+d)\,dx_2}{\int_{-\infty}^{\infty} \exp\left(-\frac{(x_1-x_2)^2}{2}\left[\frac{1}{\sigma_s^2}+\frac{c^2}{\sigma_r^2}\right]\right) dx_2}$$

$$= \frac{\int_{-\infty}^{\infty} \exp\left(-\frac{(x_1-x_2)^2}{2}[\quad]\right) c x_2\, dx_2 + d}{\int_{-\infty}^{\infty} \exp\left(-\frac{(x_1-x_2)^2}{2}[\quad]\right) dx_2}$$

= in both replace $t = x_2 - x_1$, $dt = dx_2$

$$= \frac{\int_{-\infty}^{\infty} \exp(-t^2 \times C_0)\, c(t+x_1)\, dt}{\int_{-\infty}^{\infty} \exp(-t^2 \times C_0)\, dt}$$

odd

$\rightarrow 0 \quad \left(\int_{-a}^{a} f(x)\,dx = 0\right)$

odd

$$= \frac{\int_{-\infty}^{\infty} \exp(-t^2 C_0) \times ct\, dt}{\int_{-\infty}^{\infty} \exp(-t^2 C_0)\, dt} + cx_1 + d \Rightarrow cx_1 + d$$