

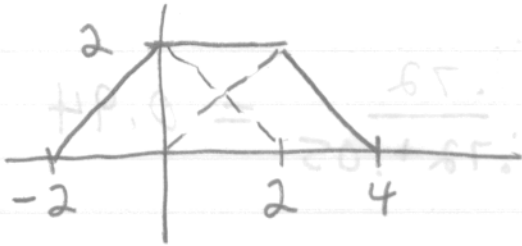
# Homework 2 - 2012 Answers

- ① A) Cone  
 B) exactly the same as the original equation, because it does have circular symmetry. Or it can even be simpler if rewritten

$$h(r) = \begin{cases} 2-r, & r < 4 \\ 0, & \text{otherwise} \end{cases}$$

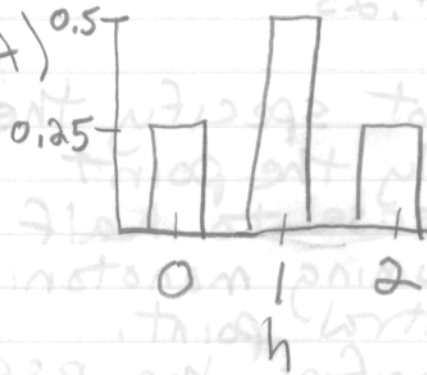
where  $r = \sqrt{x^2 + y^2}$

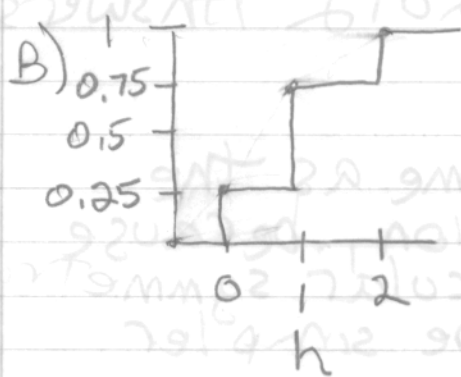
- c) The 2 impulse stamp out copies of  $h(x,y)$  on the x-axis



- D) FWHM = 2

- ② A) Probability Mass Function





Probability Distribution Function

$$C) \mu_H = \frac{1}{4} \cdot 0 + \frac{1}{2} \cdot 1 + \frac{1}{4} \cdot 2 = 1$$

$$\sigma_H = \sqrt{\frac{1}{4}(-1)^2 + \frac{1}{2}(0)^2 + \frac{1}{4}(1)^2} = \frac{1}{\sqrt{2}}$$

③ A) Disease

	+	-
Test +	.08	.45
Test -	.02	.45

$$\frac{.08}{.45 + .08} = 0.15$$

B)

.40	.25
.10	.25

$$\frac{.40}{.40 + .25} = 0.88$$

④ The FWHM does not specify the shape of the PSF, only the point at which it has decrease to half its max height, assuming monotonic decline from its central point. The MTF completely specifies the PSF by the inverse Fourier Transform.