2008 Quals Solution

a). 0

b). $Ex^2 = Ex_i^2 + Ex_i^2 = 1 + 1 = 2$

c). mean or ave. value

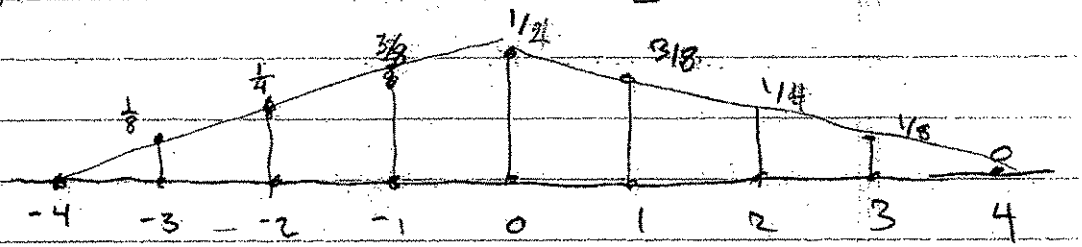
d). $Ey = 0$

e). $Ey^2 = \frac{1}{16}[2 + 2 + 2 + 2] = \frac{1}{2}$

f). $\pm 1, \pm \frac{1}{2}, 0$ For each component $5 \times 5 = \underline{25}$

g). $r_{x,k} = 2 \cdot \delta_k$

h). $r_{y,k} = \frac{1}{16}[1\ 1\ 1\ 1] * [1\ 1\ 1\ 1] * 2\delta_k$



i). ± 1 occurs 2 ways in either comp.

$\pm \frac{1}{2}$ " 8 " " " "

0 " 6 " " " "

$(0,0) = \frac{36}{256}$ $(0, \pm\frac{1}{2}) = \frac{48}{256}$ $(0, \pm 1) = \frac{12}{256}$

$(\pm\frac{1}{2}, 0) = \frac{48}{256}$ $(\pm\frac{1}{2}, \pm\frac{1}{2}) = \frac{64}{256}$ $(\pm\frac{1}{2}, \pm 1) = \frac{16}{256}$

$(\pm 1, 0) = \frac{12}{256}$ $(\pm 1, \frac{1}{2}) = \frac{16}{256}$ $(\pm 1, \pm 1) = \frac{4}{256}$

$\Sigma \rightarrow \frac{256}{256} = 1$ (checks)