

Question 1:

a:

0	0	0	0	0	0	0	0
0	1/6	1/3	1/3	1/3	1/3	1/6	0
0	1/3	2/3	2/3	2/3	2/3	1/3	0
0	0	0	0	0	0	0	0

b:

1	1	1	1	1	1	1	1
1	1/4	1/2	1/2	1/2	1/2	1/4	1
1	1/4	1/2	1/2	1/2	1/2	1/4	1
1	1	1	1	1	1	1	1

Question 3:

a:

L1

1/4	1/2	1/2	1/2	1/2	1/2	1/2	1/4
1/2	0	0	0	0	0	0	1/2
1/2	0	1	1	1	1	0	1/2
1/2	0	1	0	0	1	0	1/2
1/2	0	1	0	0	1	0	1/2
1/2	0	1	1	1	1	0	1/2
1/2	0	0	0	0	0	0	1/2
1/4	1/2	1/2	1/2	1/2	1/2	1/2	1/4

L2

5/16	1/4	1/4	5/16
1/4	3/4	3/4	1/4
1/4	3/4	3/4	1/4
5/16	1/4	1/4	5/16

L3

25/64	25/64
25/64	25/64

b:

$$\rho_x = \frac{48}{3 \times 3} = 5\frac{1}{3} \quad \rho_y = \frac{32}{1.5 \times 3} = 7\frac{1}{9}$$

$$\rho = \max(\rho_x, \rho_y) = 7\frac{1}{9}$$

$$\lambda_x = \log_2(5\frac{1}{3}) = 2.4 \quad \lambda_y = \log_2(7\frac{1}{9}) = 2.8$$

$$\lambda = \max(\lambda_x, \lambda_y) = 2.8$$

For nearest mipmap nearest, mipmap L3 should be used