

**Department of Mathematics**  
**MTL 106 (Introduction to Probability Theory and Stochastic Processes)**  
**Tutorial Sheet No. 5**  
**Answer for selected Problems**

1.

a)  $\frac{13}{18}, 0, \frac{1}{6}$

b)  $E[Y/X] = \frac{X+1}{2}$     $E[X/Y] = \frac{Y}{2}$

c) MGF =  $E[e^{t_1 X + t_2 Y}] = 4 \left[ \frac{e^{t_1} - t_1 - 1}{t_1} \right] \left[ \frac{t_2 e^{t_2} - e^{t_2} - 1}{t_2^2} \right]$  correlation coefficient = 0.5

2. 0.

5. (b)  $E \left[ (E[e^{tX_1}])^N \right]$ .

6.  $E[Y/X = x] = 7x$

31. (a)  $\frac{X^3}{3} - \frac{X}{5}, \frac{X^3}{3} + \frac{2}{15}X$

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