

Handout

$$\begin{aligned} 1) P(1/2 < x < 3/4, y < 2) \\ &= \int_2^3 \int_{1/2}^{3/4} f(x, y) dx dy = \\ &\int_2^3 \int_{1/2}^{3/4} 1/12 (3x^2 + 2y) \end{aligned}$$

$$\begin{aligned} 2) f_x(x) \cdot f_y(y) \\ 3/4 (x^2 + 1) \cdot 1/2 (2x + 3) \\ &= (3/4 x^2 + 3/4) (x + 3/2) \\ &= 3x^2/4 + 9y^2/8 + 3x + 9/4 \\ &= 1/2 (3x^2 + 2y) \\ &\neq 1/2 (3x^2 + 2y) \\ &\text{Not independent} \end{aligned}$$

$$\begin{aligned} 3) G_x &= \int_0^1 x^2 \cdot 3/4 (x^2 + 1) - \int_0^1 x^{-3/4} (x^2 + 1)^2 \\ &= -229/9 \end{aligned}$$

$$\sqrt{3 \int_0^1 x^2 \cdot 1/2 (2x + 3) - \left[\int_0^1 y \cdot 1/2 (2x + 3) \right]^2}$$

$$\begin{aligned} 4) \int_2^3 \int_{1/2}^{3/4} xy^{1/2} (3x^2 + 2x - \int_0^1 x - 3/4 (x^2 + 1)) dx \\ &= 1.8599 \\ &= 1.8599 \end{aligned}$$

$$f) a) 0.09 + 0.07 + 0.05 + 0.04 = \boxed{0.25}$$

$$b) y=0 \frac{0.09}{0.25} \dots y=3 = \frac{0.04}{0.25}$$

$y=0$	0.36	$y=2$	0.20
$y=1$	0.28	$y=3$	0.16

$$c) 0.11 + 0.05 + 0.04 + 0.02 = \boxed{0.22}$$

$$d) x=0 \frac{0.11}{0.22} \dots x=3 \frac{0.02}{0.22}$$

$x=0$	0.50	$x=2$	0.181
$x=1$	0.22	$x=3$	0.090

9) a)

x, y	0	1	2	3	4
$p_x(x)$	0.08	0.26	0.27	0.23	0.16
$p_y(y)$	0.31	0.18	0.28	0.15	0.08

$$c) p(0,0) = 0.03 \quad p_x(0) \times p_y(0)$$

$$0.03 \neq (0.08)(0.31)$$

Not Independent

$$d) \mu_x = 0 + .26 + .54 + .69 + .64 = \boxed{2.13}$$

$$\mu_y = 0 + .18 + .56 + .45 + .32 = \boxed{1.51}$$

$$e) \sigma_x \sqrt{0.3630 + \dots + 0.5595} = \boxed{1.19}$$

$$\sigma_y \sqrt{0.7063 + \dots + 0.4960} = \boxed{1.28}$$

$$f) (0)(1)(.03) + \dots (4)(4)(.02) = 3.38$$

$$3.38 - (2.13)(1.51) = 0.1637 / 0.1533$$

$$= \boxed{0.1065}$$

1)

a) 0.17

b) $0.17 + 0.06 + 0.23 + 0.14 = 0.60$

c) $0.10 + 0.11 + 0.05 = 0.26$

2) $1 - (0.10 + 0.17 + 0.06) = 0.67$

e) $1 - 0.26 = 0.74$

f) $1 - 0.67 = 0.33$

g) 0.10

2)

a) $0.10 + 0.11 + 0.05$	$x=0$	0.26
$0.17 + 0.23 + 0.08$	$x=1$	0.48
$0.06 + 0.14 + 0.06$	$x=2$	0.26

b) $0.10 + 0.17 + 0.06$	$y=0$	0.33
$0.11 + 0.23 + 0.14$	$y=1$	0.48
$0.05 + 0.08 + 0.06$	$y=2$	0.19

c) $0(.26) + 1(.48) + 2(.26) = 1$

2) $0(.33) + 1(.48) + 2(.19) = 0.86$

e) $\sqrt{0^2(0.26) + \dots + 2^2(0.26) - 1^2} = 0.7211$

f) $\sqrt{0^2(0.33) + \dots + 2^2(0.19) - (0.86)^2} = 0.707$

g) $(1)(1)(.23) + (1)(2)(.08) + (2)(1)(.14) + (2)(2)(.06) - (1)(-.86) = 0.05$

h) $\frac{0.05}{(0.7211)(0.707)} = 0.098$

i) Not independent because ρ_{xy} doesn't equal zero.