Ω
$X_1, X_2 :$
$\Omega \to$
R
(X_1, X_2)
ran-
dom
vec-
tor
(X_1, X_2)
$\chi =$
$\{(x_1, x_2) :$
$X_1(\omega) =$
$x_1, X_2(\omega) =$
$x_2, \omega \in$
$\Omega\}$
$(X_1 \leq$
$x_1) \cap$
$(X_2 \leq$
$x_2)$
$(x_1, x_2) \in$
R^2
(X_1, X_2)
joint
cdf
$F_{X_1,X_2}(x_1, x_2) = P((X_1 \leq x_1) \cap (X_2 \leq x_2)).$

R^2
(X_1, X_2)
F_{X_1,X_2}
$a_1, b_1, a_2, b_2 \in$
R
$a_1 <$
b_1
$a_2 <$
b_2
$P((X_1, X_2) \in [a_1, b_1] \times [a_2, b_2]) = F_{X_1,X_2}(b_1, b_2) - F_{X_1,X_2}(a_1, b_2) - F_{X_1,X_2}(b_1, a_2) + F_{X_1,X_2}(a_1, a_2).$

(X_1, X_2)
dis-
crete
χ
X_1
X_2
(X_1, X_2)
joint
pmf
(X_1, X_2)

$p_{X_1,X_2}(x_1, x_2) = P(X_1 = x_1, X_2 = x_2).$

$0 \leq$
$p_{X_1,X_2}(x_1, x_2) \leq$
1
$(x_1, x_2) \in$
χ
$\sum_{(x_1,x_2) \in \chi} p_{X_1,X_2}(x_1, x_2) =$
1
X
Y
$W =$
$\max(X, Y)$
(X, W)
$p_{X,W}$
(X, W)
W/X

					$\frac{1}{36}$
				$\frac{1}{36}$	$\frac{2}{36}$
			$\frac{1}{36}$	$\frac{1}{36}$	$\frac{3}{36}$
		$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{4}{36}$
	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{5}{36}$
$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{1}{36}$	$\frac{6}{36}$

$0 \leq$
$p_{X,W}(x, w) \leq$
1
$\sum_{(x,w) \in (X,W)} p_{X,W}(x, w) =$
1
$\sum_{(x,w) \in \chi x=w} p_{X,W}(x, w)$
$=$
$\frac{7}{12}$
$F_{X,Y}$