Mr. Hansen
STAtistics HW due
4/30/010 [excerpt]

Barron's p. 423, #18

Hopefully, you will find this explanation clearer than the book's explanation!

Let $a = P(X=3)$
$b = P(Y=1)$

Given: X and Y are indep. random variables, and Y can have the values $y=1$ or $y=2$ only.

We know $ab = .14$ and $a(1-b) = .26$.
(This requires independence! This would not be true in general.)

Make a system of equations: $\begin{cases} ab = .14 \\ a(1-b) = .26 \end{cases}$

Divide first equation by the second to get

$$\frac{b}{1-b} = \frac{.14}{.26}$$

Cross-multiply to get $.26b = .14(1-b)$, then use algebra [steps omitted] to get $b = \frac{.14}{.4} = .35$.
We want $P(Y=2)$, which is $1-b = \boxed{.65}$.