2015 Q3

(a) X = # ATMs working

X	0	1	2	3
P	.15	.21	.40	.24

$P(X \geq 1) = P(X=1) + P(X=2) + P(X=3)$ (OR = add)

$= .21 + .40 + .24$

$= \boxed{.85}$

(b) expected value $= (0)(.15) + (1)(.21) + (2)(.40) + (3)(.24) = \boxed{1.73 \text{ ATMs}}$

(or could use values in L1, probabilities in L2, 1-var Stats L1, L2, use $\bar{x}$)

{AP would prefer the hand calculation, though}

(c) $P(x=3 \mid x \geq 1) = \frac{.24}{.85} = \boxed{.2824}$

(conditional)

(d) The expected value for number of ATMs would increase because the 0 case is eliminated, so it's probability would be distributed into the 1, 2, 3 cases, raising their probabilities.

Specifically, here is the new sample space:

X	1	2	3
P	$\frac{.21}{.85}$	$\frac{.40}{.85}$	$\frac{.24}{.85}$
	(.2471)	(.4706)	(.2824)

So the new $\mu = EV = (1)(.2471) + (2)(.4706) + (3)(.2824)$

$= 2.0355$