

136. Key: D

X follows a geometric distribution with $p = \frac{1}{6}$. $Y = 2$ implies the first roll is not a 6 and the second roll is a 6. This means a 5 is obtained for the first time on the first roll (probability = 20%) or a 5 is obtained for the first time on the third or later roll (probability = 80%).

$$E[X | X \geq 3] = \frac{1}{p} + 2 = 6 + 2 = 8, \text{ so } E[X | Y = 2] = 0.2(1) + 0.8(8) = 6.6$$