B+

29. a. $E(x) = \sum_{x} x\,p(x) = 0.05\times1 + 0.10\times2 + 0.35\times4 + 0.40\times8 + 0.10\times16$

$= 6.45$

b. $V(x) = \sum_{x\in D} (x-\mu)^2 p(x) = (1-6.45)^2\times0.05 + (2-6.45)^2\times0.10 + (4-6.45)^2\times0.35 + (8-6.45)^2\times0.40 + (16-6.45)^2\times0.1$

$= 15.6475$

c. $\sigma(x) = \sqrt{V(x)} = 3.96$

d. $V(x) = E(X^2) - (E(x))^2$

$= \sum_{x\in D} x^2 p(x) - (E(x))^2$

$= 1\times0.05 + 4\times0.10 + 16\times0.35 + 64\times0.40 + 256\times0.1 - 6.45^2$

$= 15.6475$

33 a. $E(X^2) = 0^2 p(0) + 1^2 p(1) = p(1) = p$

b. $V(x) = E(X^2) - (E(X))^2 = p - p^2 = p(1-p)$

$E(X^{79}) = 0^{79} p(0) + 1^{79} p(1) = p$

c.

38. $E\left(\frac{1}{x}\right) = \frac{1}{6}\left(\frac{1}{1} + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} + \frac{1}{6}\right)$

$= \frac{49}{120} > \frac{2}{7}$

91. $V(h(X)) = \sum_{D} \{h(x) - E[h(x)]\}^2 p(x)$

$= \sum_{D} \{ax + b - (a\mu + b)\}^2 p(x)$

$= \sum_{D} \{a(x-\mu)\}^2 p(x)$

$= a^2 \cdot \sigma_X^2$