Brian
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Math 331

3/9 Homework

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	1	2			
A	.500 = $\frac{1}{2}$	.200 = $\frac{200}{1000}$	= $\frac{201}{1002}$	= .201	38 A
B	.400 = $\frac{4}{10}$	.190 = $\frac{19}{100}$	= $\frac{23}{110}$	= .230	39 A
C	.300 = $\frac{300}{1000}$	.100 = $\frac{1}{10}$	= $\frac{301}{1010}$	= .298	40 A

39.

a	P(X = a)
4	$p^4 + (1-p)^4$
5	$\binom{4}{3}p^4(1-p) + \binom{4}{3}p(1-p)^4$
6	$\binom{5}{3}p^4(1-p)^2 + \binom{5}{3}p^2(1-p)^4$
7	$\binom{6}{3}p^4(1-p)^3 + \binom{6}{3}p^3(1-p)^4$

$P(X_{n,p} = k) = \binom{n}{k}p^k(1-p)^{n-k}$

$P(X=4) = \binom{4}{4}p^4 + \binom{4}{4}(1-p)^4$

$= p^4 + (1-p)^4$

$P(X=5) = \left(\binom{4}{3}p^3(1-p)\right)p + \left(\binom{4}{3}p(1-p)^3\right)(1-p)$

$= \binom{4}{3}p^4(1-p) + \binom{4}{3}p(1-p)^4$

$P(X=6) = \left(\binom{5}{3}p^3(1-p)^2\right)p + \left(\binom{5}{3}p^2(1-p)^3\right)(1-p)$

$= \binom{5}{3}p^4(1-p)^2 + \binom{5}{3}p^2(1-p)^4$

$P(X=7) = \left(\binom{6}{3}p^3(1-p)^3\right)p + \left(\binom{6}{3}p^3(1-p)^3\right)(1-p)$

$= \binom{6}{3}p^4(1-p)^3 + \binom{6}{3}p^3(1-p)^4$

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a	P(X = a)	a P(X=a)	a^2	a^2 P(X=a)
4	$\frac{1}{16} + \frac{1}{16} = \frac{1}{8}$	$\frac{1}{2}$	16	2
5	$\binom{4}{3}\cdot\left(\frac{1}{2}\right)^5 \cdot 2 = \binom{4}{3}\cdot\frac{1}{16} = \frac{1}{4}$	$\frac{5}{4}$	25	$\frac{25}{4}$
6	$\binom{5}{3}\left(\frac{1}{2}\right)^5 = \binom{5}{3}\cdot\frac{1}{32} = \frac{5}{16}$	$\frac{30}{16} = \frac{15}{8}$	36	$\frac{90}{8}$
7	$\binom{6}{3}\left(\frac{1}{2}\right)^6 = \binom{6}{3}\cdot\frac{1}{64} = \frac{5}{16}$	$\frac{35}{16}$	49	$\frac{245}{16}$

$E(X) = 5.8125$

$E(X^2) = 34.8125$

$34.8125 - (5.8125)^2 = 1.03$

$\text{var}(X) = 1.03$

$\sqrt{1.03} = 1.015$

$sd(X) = 1.015$