

ACTEX Five Practice Exams for P/1

Errata 4th Printing 6/7/11

Following are corrected problems and solutions for insertion into this manual.

Question 2-21

The distribution for the question is $P(X = n) = \binom{r-1}{n-1} p^n (1-p)^{r-n}$

Question 2-30

Suppose $P(A) = 0.30$, $P(B) = 0.45$, and $P(A \cap B) = 0.35$.

Calculate $P(A \cup B)$.

- A) 0.10
- B) 0.14
- C) 0.25
- D) 0.40
- E) 0.65

Question 3-19

The distribution for the question is $P(X = n) = \binom{r-1}{n-1} p^n (1-p)^{r-n}$

Question 5-16

The random variable should be $P(X = k) = \frac{1}{14}(4 - k)^2$ for $k = 1, 2, 3, 4$.

Answer options should be

- A) 139
- B) 153
- C) 167
- D) 180
- E) 194

Question 5-24

The distribution for the question is $P(X = n) = \frac{e^{-p} p^n}{n!}$

Question 2-30 Solution

Replace last 3 lines with

$$\text{D } P(A \cap B) = 0.30 + 0.45 - 1 + 0.35$$

$$\text{D } P(A \cap B) = 0.10$$

Answer: A

Question 5-16 Solution

Let X be the random variable representing the total benefit payment. The standard

deviation of X is equal to $(\text{Var}(X))^{1/2} = (E(X^2) - (E(X))^2)^{1/2}$. First we will find $E(X)$.

$$E(X) = \sum_{k=1}^2 \frac{125}{7} k(4-k)^2 + \sum_{k=3}^4 \frac{1}{14} (200+150k)(4-k)^2 = \frac{2125}{7} + \frac{325}{7} = 350$$

$$E(X^2) = \sum_{k=1}^2 \frac{31250}{7} k^2(4-k)^2 + \sum_{k=3}^4 \frac{1}{14} (200+150k)^2 (4-k)^2 = \frac{781250}{7} + \frac{211250}{7} =$$

141,786

$$\text{Thus, } \text{Var}(X) = E(X^2) - (E(X))^2 = 141,786 - (350)^2 = 19,286$$

And so the standard deviation is the square root of this, or 138.873.

Answer: A