

This quiz covers material from sections 7.5–8.3.

**1.** (*2 points*) A man wishes to purchase a 5-yr term-life policy from Acme Insurance, Inc. that will pay \$20,000 in the event that the man's death occurs during the next 5 yr. Using Acme's life insurance tables, he determines that the probability that he will live another 5 yr is .96. What is the minimum amount that he can expect to pay for his premium?

**2.** (*3 points*) Acme Outfitters is a chain of high-end clothing stores that caters to young adults. For their winter collection, they are releasing five styles of jeans and four different tops. At each store, an assistant manager is in charge of organizing the front display that showcases three different items. The assistant manager is given full control over what will be in the display.

**a.** (*1 pt*) Create a probability distribution for the number of jeans in the display.

**b.** (*1 pt*) Draw the histogram.

**c.** (*1 pt*) What is the expected number of jeans in the display?

**3.** (*6 points*) Acme Paint Co. creates two different shades of latex paint: eggshell and electric pink. Due to unavoidable flaws in the manufacturing system, one color of paint will occasionally splash into another color. The data below is the amount of pink paint that leaches into the eggshell.

Amount (mL/L)	5	10	15	20	25	30	35	40	45
Probability	30%	20%	10%	6%	5%	5%	1%	1%	1%

Let  $X$  represent the volume of pink paint per liter of eggshell manufactured.

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**a.** (3 pts) The discoloration of the eggshell paint becomes discernible to the human eye when the concentration of pink paint exceeds 25mL/L. Calculate the probability that a randomly chosen sample of Acme's eggshell paint is discolored.

**b.** (3 pts) Calculate  $E(X)$ .

**c.** (3 pts) Calculate  $\text{Var}(X)$ .

**d.** (3 pts) Calculate  $\sigma$ .

**4.** (4 points) Acme's Club is a national megamarket that carries a wide array of products. The company is preparing its 4Q expected earnings statement, and needs to incorporate the following data on the demographics of its customers.

Age	20–	21–25	26–30	31–35	36–40	41–45	46–50	51–55	56+
# of customers (in thousands)	10	8	30	40	40	36	31	21	19
Average purchase (in \$)	9	20	45	59	85	65	40	41	39

Let  $X$  represent the amount of money a randomly chosen customer spends at Acme's Club.

**a.** (3 pts) Calculate  $\mu$ .

**b.** (3 pts) Calculate the variance of  $X$ .

**c.** (3 pts) Calculate the standard deviation of  $X$ .