

Question 1: [15 marks] Overdraft fees from some of the largest banks range from \$9 to \$39. Consumers believe these charges are annoying and excessive, but the fees generate huge revenue for banks, \$34.3 billion in 2017. The Overdraft Protection Act of 2013 is designed to limit overdraft fees in a variety of ways and to require fees to be reasonable and proportional to the amount of the overdraft. Let X be the amount of an overdraft fee for a randomly selected bank. The probability distribution for X is given in the table.

x	10	12	15	20	25	27	30	35	38
$p(x)$	0.02	0.06	0.08	0.10	0.16	0.28	0.15	0.07	0.08

- [6=3,2,1 marks]** Find the mean, variance, and standard deviation of the overdraft amount. Show **all your work** in order to get full marks.
- [3 marks]** Find the probability that a randomly selected bank has an overdraft fee greater than \$25. Show **all your work** in order to get full marks.
- [3 marks]** Find the probability that a randomly selected bank has an overdraft fee less than $\mu - \sigma$. Show **all your work** in order to get full marks.
- [3 marks]** Suppose three banks are selected at random. What is the probability that at least one bank has an overdraft fee less than \$20? Show **all your work** in order to get full marks.