Practice Quiz 5

Statistics 0200
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1. (2 pts.) A survey in 2001-2002 found the following probability distribution for American's number X of visits to the emergency room in the preceding year:

X	0	1	2	3	4	5
Probability	0.78	0.14	0.04	0.02	0.01	0.01

   (a) Find the mean number of visits per person.

   (b) Keeping in mind that standard deviation σ measures the typical distance of values of X from their mean, which of these is the only reasonable guess for standard deviation? (No calculations necessary.) (i) 0.09 (ii) 0.90 (iii) 9.0 (iv) 90

   (c) A histogram of the distribution would show
   (i) some left skewness (ii) some right skewness (iii) perfect symmetry

   (d) Will the 68-95-99.7 Rule do a fairly good job of estimating probability of being more than two standard deviations above the mean?

2. (4 pts.) Researchers at Harvard Medical School reported in 2005 that the proportion of all bankruptcies in the U.S. that were due to medical bills was .50.

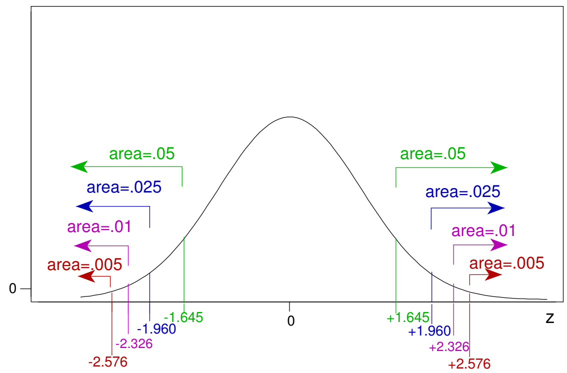
   (a) In random samples of 20 bankruptcies, the distribution of sample proportion due to medical bills has mean ______.

   (b) The standard deviation for samples of 20 bankruptcies is 0.11. If sample size were increased, the standard deviation would be (i) smaller (ii) larger (iii) the same

   (c) Since $20(0.5) = 10$ and $20(1 - 0.5) = 10$, the shape of the distribution of sample proportion is
   (i) not at all normal (ii) just roughly normal (iii) almost perfectly normal

   (d) Suppose 11 in a sample of 20 bankruptcies are due to medical bills. Identify each of the following: (i) X ______(ii) n ______(iii) p ______(iv) $\hat{p}$ ______

3. (2 pts.) Butter clams' lengths (in centimeters) have mean 5.7 and standard deviation 2.2. Once z scores are found, this sketch of the tails of the normal curve can be used to estimate probabilities.

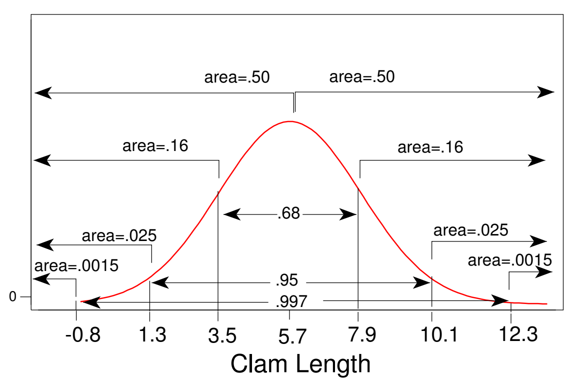


(a) Find the z score when a clam is 11 centimeters long.

(b) The probability of being more than 11 centimeters long is between (i) 0 and 0.005 (ii) 0.005 and 0.01 (iii) 0.01 and 0.025 (iv) 0.025 and 0.05

(c) Find the z score when a clam is 5.0 centimeters long: ______. A length of 5 cm is (i) sort of small (ii) unusually small (iii) virtually impossible

4. (2 pts.) This graph shows the distribution of butter clam lengths (in centimeters), based on mean and standard deviation and the 68-95-99.7 Rule:



(a) 68% of lengths are between ______and ______centimeters long.

(b) The probability of being more than 11 centimeters is (i) smaller than 0.0015 (ii) between 0.0015 and 0.025 (iii) between 0.025 and 0.16 (iv) between 0.16 and 0.50 (v) greater than 0.50

(c) Which of these is your best guess for the probability of being less than 4 centimeters? (i) 0.02 (ii) 0.12 (iii) 0.22

(d) Which of these is your best guess for the length that has 5% of all values below it? (i) 2.1 (ii) 4.1 (iii) 6.1