MATHEMATICS DEPARTMENT
Stat2361 Worksheet#3

- **Name.....** - **Rasha Shadid**

(Q1) Assume that z is a standard normal random variable. Find z in the following situations.

(1) The area to the left of z is 0.9750

(2) The area to the left of z is 0.9000

(3) The area to the left of z is 0.9900

(4) The area to the left of z is 0.9500

(5) The area to the left of z is 0.1151

(6) The area to the left of z is 0.2200

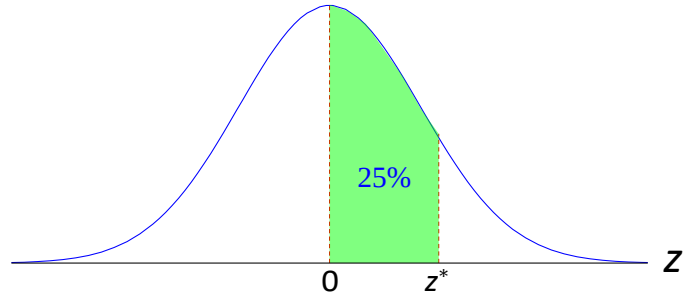
(7) The area to the right of z is 0.0400

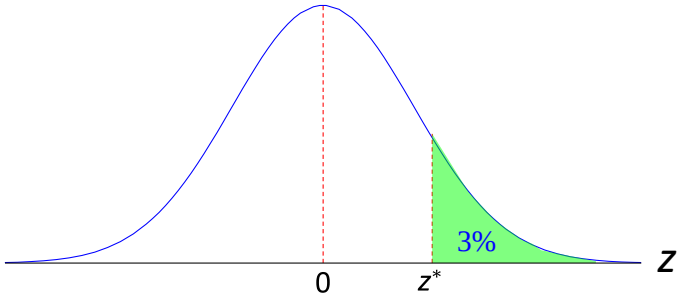
(8) The area to the right of z is 0.8700

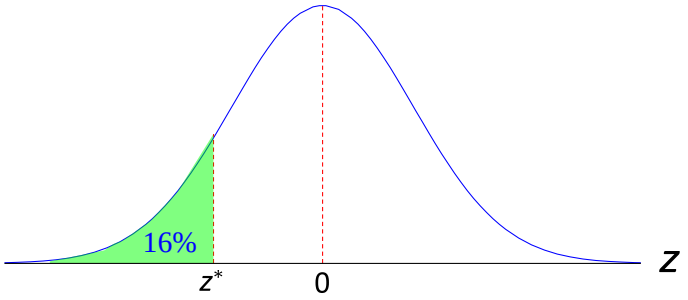
(9) The area between 0 and z is 0.3210

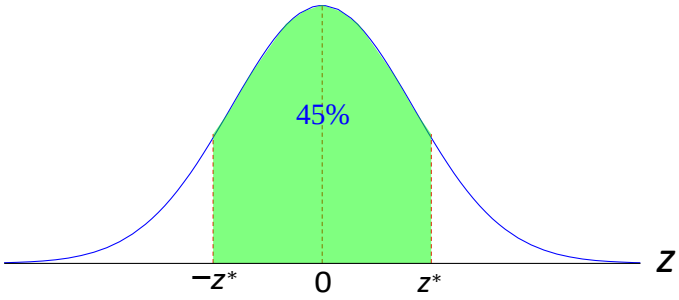
(10) The area between $-z$ and z is 0.7500

(Q2) Find z^* in each situation below.









(Q3) Let x be a normally distributed variable with $\mu = 120$ and $\sigma = 12$

(1) Find the z-score of $x = 124$

(2) Find x if $z = -2.67$

(3) Find the probability that x is at least 110

(4) Find the percentage of x between 100 and 135

(5) Find the minimum x in the top (upper) 10%

(6) Find the maximum x in the bottom (lower) 20%

(7) Find the range of x in the middle 85%

(Q4) A coin is tossed 7 times. What is the probability of getting exactly two heads?

(Q5) It is known that 30% of tennis players are left-handed.

(1) In a sample of 8 players, what is the probability that two players are left-handed?

(2) In a sample of 10 players, what is the probability that more than one player is left-handed?

(3) In a sample of 20 players, what is the expected number of left-handed players?

(4) In a sample of 6 players, what is the probability that all of them are right-handed?

(Q6) The students of BZU consume on average 2.68 cups of coffee per day. Suppose that the consumption of coffee is normally distributed with a standard deviation of 0.94

(1) What is the probability that a randomly student drinks at most one cup of coffee?

(2) What is the percentage of students who drink between two and four cups of coffee?

(3) If 500 students are selected, approximately how many drink more than three cups of coffee?

(Q7) The grades of BZU students in Stat2361 are usually normally distributed with average of 71 and standard deviation of 11.6

(1) What is the probability that a student's grade will exceed 95?

(2) What is the percentage of students who will pass this course?

(3) Find the 90th percentile.

(4) A grade in the bottom 25% is considered "hopeless", what is a "hopeless" grade?

(Q8) If the number of baby deliveries in Ramallah's hospital is known to be Poisson distributedwith an average of 2 babies per day

(1) What is the probability that 12 babies will be delivered in a week?

(2) What is the probability that at least two babies will be delivered in a day?

(3) What is the probability that at most one baby will be delivered in a day?

(4) What is the expected number of baby deliveries in a month?

(5) What is the standard deviation of the number of baby deliveries in two weeks?

(Q9) Assume a random sample of size 15 has a mean of 58.60 and a standard deviation of 7.54

(1) Construct a 90% confidence interval for the population mean. Interpret your result.

(2) Construct a 95% confidence interval for the population mean. Interpret your result.

(3) Construct a 99% confidence interval for the population mean. Interpret your result.

(Q10) If the interval [30, 42] is a 95% confidence interval for μ

(1) Find the sample mean.

(2) Find the margin of error.

(3) Find $t_{a/2}$ if the sample size is 24

(Q11) Use the *t* table to find the following values.

(1) $z_{a/2}$, for a 98% confidence interval.

(2) $t_{a/2}$, for a 98% confidence interval, given that $n = 28$

(Q12) A researcher found that in a sample of 50 retired men, the average number of jobs they had in their lifetimes is 7.20. Assuming that the population standard deviation is 2.10, find the 95% confidence interval of the mean number of jobs. Then interpret your result.

(Q13) A health magazine is interested in the noise level (in decibels) at urban hospitals. A simplerandom sample of size 20 was taken. In this sample, the mean was 41.60 and the standard deviation was 7.50. Find the 95% confidence interval for the true mean noise level.

(Q14) What happens to the margin of error and the confidence interval of μ in the following cases?

(1) If the confidence level decreases.

(2) If the sample size decreases.