(1) Scores on a university exam are Normally distributed with a mean of 68 and a standard deviation of 9. Using the $68 - 95 - 99.7$ rule, what percentage of students score above 77? Can you give a more precise percentage?
(2) Scores on the SAT verbal test follow approximately the $N(504, 111)$ distribution. What is the proportion of students scoring between 450 and 550?
(3) The scores on a university examination are Normally distributed with a mean of 62 and a standard deviation of 11. If the bottom 5% of students will fail the course, what is the lowest mark that a student can have and still be awarded passing grade?
(4) The time to complete a standardized exam is approximately Normal with a mean of 70 minutes and a standard deviation of 10 minutes. How much time should be given to complete the exam so 80% of the students will complete the exam in the time given?
(5) Two six-sided dice are thrown (one red, one green). Some possibilities are $(red = 1, green = 2), (red = 2, green = 2)$ etc.
  (a) How many possibilities are there?
  (b) What is the probability that the sum of the two dice comes out to be 10? What is the probability that the sum of the two dice comes out to be 7?
  (c) What is the probability that the numbers on the two dice are equal?
(6) The heights (in feet) and weights (in pounds) of four men are $(6, 180)$, $(5, 160)$, $(5.5, 170)$ and $(6.1, 180)$. Find the sample regression line.
John has a height of 5.1. Could you give an estimate of his weight?
(7) Government data assign a single cause for each death that occurs in the United States. The data show that the probability is 0.45 that a randomly chosen death was due to cardiovascular (mainly heart) disease, and 0.22 that it was due to cancer. What is the probability that a death was due either to cardiovascular disease or to cancer? What is the probability that the death was due to some other cause?
(8) Test the claim that the population of sophomore college students has a mean grade point average greater than 2.25. Sample statistics include $n = 60, \bar{x} = 2.39$ and $s = 0.9$. Use a significance level of $\alpha = 0.05$.
(9) Suppose that we have a sample from a Normal$(\mu, 10)$ population and we want to test

$$H_0 : \mu = 53 \text{ versus } H_a : \mu < 53.$$

Use $\alpha = 0.05$. For what values of $\bar{x}$ would we reject the null hypothesis? Suppose now that the sample has $\bar{x} = 54$. Would we reject the null hypothesis? Find the P-value of the test. Also find the power of the test.

(10) A new cream that advertises that it can reduce wrinkles and improve skin was subject to a recent study. A sample of 59 women over the age of 50 used the new cream for 6 months. Of those 59 women, 32 of them reported skin improvement(as judged by a dermatologist). Is this evidence that the cream will improve the skin of more than 40% of women over the age of 50? Test using $\alpha = 0.01$.
Also find a 95% confidence interval for the proportion p of women over age 50 for whom the cream improves the skin. How big of a sample should you take if you want a margin of error less than 0.001?

(11) Suppose a group of 900 smokers (who all wanted to give up smoking) were randomly assigned to recieve an antidepressant drug or a placebo for six weeks. Of the 148 patients who recieved the antidepressant drug, 23 were not smoking one year later. Of the 752 patients who recieved the placebo, 97 were not smoking one year later. Test to see if the use of antidepressant drugs is effective against smoking. Use $\alpha = 0.05$.

(12) Test the null hypothesis of the independence of the two classifications, A and B, of the 3×3 contingency table shown below. Test using $\alpha = 0.05$.

	B_1	B_2	B_3
A_1	43	48	49
A_2	73	56	45
A_3	72	60	48

(13) Among drivers who have had a car crash in the last year, 230 were randomly selected and categorized by age, with the results listed in the table below.

Age	Under 25	25-44	45-64	Over 64
Drivers	87	54	33	56

If all ages have the same crash rate, we would expect (because of the age distribution of licensed drivers) the given categories to have $16\%, 44\%, 27\%, 13\%$ of the subjects, respectively. At the 0.05 significance level, test the claim that the distribution of crashes conforms to the distribution of ages.