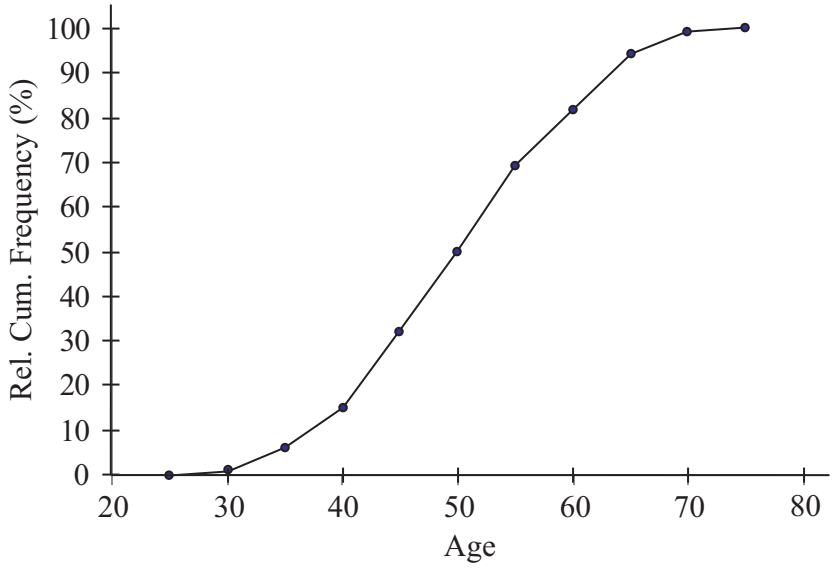
4. In a company, 78% of the employees opt for medical insurance and 42% of the employees opt for life insurance. 82% of the employees opt for at least one of these benefits. What percent of the employees opt for both of these benefits?

   (A) 4%
   (B) 18%
   (C) 33%
   (D) 38%
   (E) 40%

Answer



5. A society has 160 members. A relative cumulative frequency graph of their ages is shown in the figure above. Approximately how many of the society's members are over 43 years old?

   (A) 25
   (B) 40
   (C) 48
   (D) 75
   (E) 120

Answer

6. A track and field coach wants to find out whether a particular hammer thrower performs better, on average, in the morning or in the afternoon. The coach observes a random sample of the athlete's morning throws and a random sample of the athlete's afternoon throws. Which one of the following significance tests could be used to analyze the results?

(A) One sample *t*-test for a mean
(B) Two sample *t*-test for means
(C) Paired *t*-test
(D) One proportion *z*-test
(E) Two proportion *z*-test

Answer

7. Diana has several children and each of her children has several friends, so she can never be sure how many children will come to dinner. However, over long experience she has worked out that the probability distribution for the number of children who will come to dinner is as shown below.

Number of children	0	1	2	3	4	5	6	7	8	9	10
Probability	0.01	0.04	0.13	0.15	0.16	0.17	0.12	0.09	0.07	0.04	0.02

On any given evening, what is the minimum number of places that she should set at the dinner table for the children in order to be at least 80% sure that all the children can be seated?

(A) 6
(B) 7
(C) 8
(D) 9
(E) 10

Answer

8. A machine produces metal springs for computer lids. Over a long period of time it has been found that 10% of the springs produced by the machine are defective. After some adjustments to the machine, a random sample of 200 springs is selected and it is found that 16 of the springs in the sample are defective. The appropriate significance test is carried out in order to determine whether the proportion of defective springs has changed. Which of the following is the correct *p*-value for the test?

(A) $2 \cdot P\left(z < \dfrac{0.08 - 0.1}{\sqrt{\dfrac{(0.1)(0.9)}{200}}}\right)$

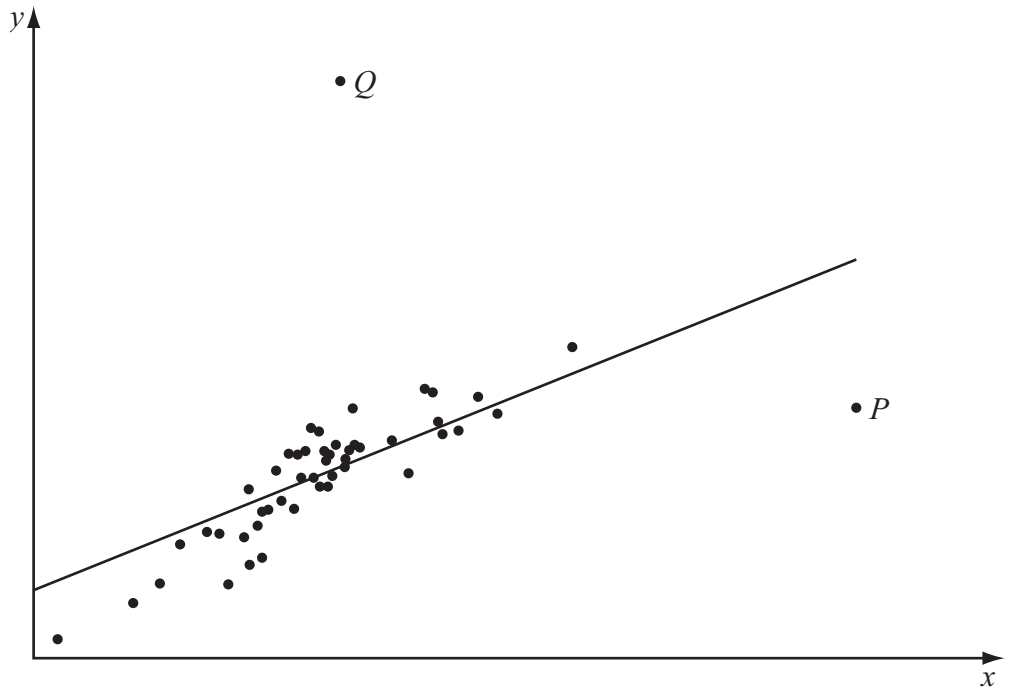
(B) $2 \cdot P\left(z > \dfrac{0.08 - 0.1}{\sqrt{\dfrac{(0.1)(0.9)}{200}}}\right)$

(C) $2 \cdot P\left(z < \dfrac{0.08 - 0.1}{\sqrt{\dfrac{(.08)(.92)}{200}}}\right)$

(D) $2 \cdot P\left(z > \dfrac{0.08 - 0.1}{\sqrt{\dfrac{(.08)(.92)}{200}}}\right)$

(E) $\dfrac{1}{2} \cdot P\left(z < \dfrac{0.08 - 0.1}{\sqrt{\dfrac{(.08)(.92)}{200}}}\right)$

Answer



9. The scatterplot above shows 52 points with the associated least squares regression line for predicting values of y from values of x. One of the two labeled points – either P or Q – will be removed. Which of the following is true?

(A) Removal of the point P would substantially increase the slope of the least squares regression line. Removal of the point Q would have little effect on the slope of the least squares regression line.
(B) Removal of the point P would substantially decrease the slope of the least squares regression line. Removal of the point Q would have little effect on the slope of the least squares regression line.
(C) Removal of the point Q would substantially increase the slope of the least squares regression line. Removal of the point P would have little effect on the slope of the least squares regression line.
(D) Removal of the point Q would substantially decrease the slope of the least squares regression line. Removal of the point P would have little effect on the slope of the least squares regression line.
(E) Removal of the point P would have a substantial effect on the slope of the least squares regression line and removal of the point Q would have a substantial effect on the slope of the least squares regression line.

Answer

10. In a particular country it is known that 40% of the residents have blue eyes, 35% of the residents have brown eyes, and 25% of the residents have green eyes. A student carries out a study to determine whether, in terms of color, the eyes of dolls manufactured in that country are representative of the residents of the country. The student takes a random sample of 40 brands of doll, and finds that 10 of them have blue eyes, 19 of them have brown eyes, and 11 of them have green eyes. She then carries out the appropriate significance test and obtains the *p*-value for the test. Which of the following is true?

    (A) The *p*-value is between 0 and 0.05.
    (B) The *p*-value is between 0.05 and 0.1.
    (C) The *p*-value is between 0.1 and 0.15.
    (D) The *p*-value is between 0.15 and 0.2.
    (E) The *p*-value is greater than 0.2.

Answer

11. A machine at a casino returns money to the player on 20% of plays. A player makes plays on the machine repeatedly, hoping to get a return. Assuming that the outcomes of the plays are independent, what is the probability that it takes at least three plays for the player to get a return?

    (A) 0.128
    (B) 0.312
    (C) 0.488
    (D) 0.512
    (E) 0.640

Answer