

Normal Probability Review Problems

Find the given probability.

1) $P(z < 1.25)$

2) $P(z \geq -0.43)$

3) $P(-2.05 < z < -1.13)$

4) Find the z -value that separates the lower 1% of all z -values from the rest.

5) Find the z -value that separates the upper 15% of all z -values from the rest.

6) Find the z -value that separates the middle 93% of all z -values from the rest.

7) The heights of adult males are normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches. Find the probability that an adult male is 6' or taller.

8) The heights of 12-month-old boys are approximately normally distributed with a mean of 29.8 inches and a standard deviation of 1.2 inches. What height separates the tallest 33% of all 12-month-old boys from the rest?

9) Scores for high school sophomores on the Mathematics portion of the PSAT (Preliminary SAT/National Merit Scholarship Qualifying Test) are approximately normally distributed with a mean of 46.1 and a standard deviation of 10.5. Scores on the PSAT are whole numbers, with a low of 20 and a high of 80.

A high school decides to set up a program for students who struggled on the PSAT math exam, so that they may improve their performance. They decide to invite students who scored in the lower 25% nationally. What is the highest score that will be invited into this program?

10) At a certain community college, the time that is required by students to complete the math competency exam is approximately a normal distribution with a mean of 57.6 minutes and a standard deviation of 8 minutes. Find the probability that a student takes longer than 1 hour to complete the test.

11) A statistics final exam produces scores that are approximately normally distributed with a mean of 225 points and a standard deviation of 20 points. There are 300 points possible on the exam, and scores are always whole numbers. Five percent of all students score below what score?

12) The lengths of human pregnancies are normally distributed with a mean of 268 days and a standard deviation of 15 days. Find the probability that a human pregnancy lasts between 254 days and 261 days.

13) The heights of 12-month-old boys are approximately normally distributed with a mean of 29.8 inches and a standard deviation of 1.2 inches. Find the probability that a 12-month-old boy is less than 28 inches tall.

14) SAT Math scores are normally distributed with a mean of 512 points and a standard deviation of 112 points. SAT scores range from 200 to 800, and are always a multiple of 10. What scores separate the middle 60% of all scores from the rest?

15) The heights of adult males are normally distributed with a mean of 69.0 inches and a standard deviation of 2.8 inches. A builder wants to make the height of his doorways so that only 3% of adult males will have to duck upon entering the room. How high should the doorways be?

16) IQ scores are approximately normally distributed with a mean of 100 points, and a standard deviation of 15 points. IQ scores are always in whole numbers. Find the probability that a person has an IQ that is at least 120.

17) IQ scores are approximately normally distributed with a mean of 100 points, and a standard deviation of 15 points. IQ scores are always in whole numbers. Mensa, a group for people of high intelligence, requires that its members be in the top 2% on any intelligence test. What IQ is the lowest possible for admission to Mensa?

18) A computer software package generates random numbers that are normally distributed with a mean of 400 and standard deviation of 100. Find the probability that a value will be between 525 and 650.