

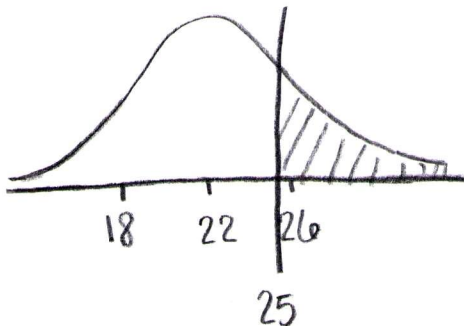
Chapter 2 FRAPPY!

Sample 1

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

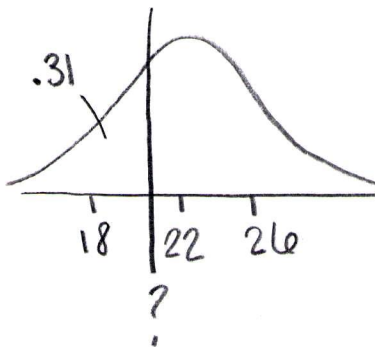
The distribution of scores on a recent test closely followed a Normal distribution with a mean of 22 points and a standard deviation of 4 points.

- (a) What proportion of the students scored at least 25 points on this test?



$$\begin{aligned} &\text{normalcdf}(\text{lower}: 25, \text{upper}: 1000, \\ &\quad \text{mean}: 22, \text{SD}: 4) \\ &= 0.2266 \end{aligned}$$

- (b) What is the 31st percentile of the distribution of test scores?



$$\begin{aligned} &\text{invnorm}(\text{area}: 0.31, \text{mean}: 22, \text{SD}: 4) \\ &= 20 \end{aligned}$$

Sample 1

- (c) The teacher wants to transform the test scores so that they have an approximately Normal distribution with a mean of 80 points and a standard deviation of 10 points. To do this, she will use a formula in the form:

$$\text{new score} = a + b (\text{old score})$$

Find the values of a and b that the teacher should use to transform the distribution of test scores.

$$100 = 80 + 10 (\text{old score})$$

$$a = \text{mean value} = 80$$

$$b = \text{SD} = 10$$

By doing this, you bring the average up so the mean will be 80 ± 10 .

- (d) Before the test, the teacher gave a review assignment for homework. The maximum score on the assignment was 10 points. The distribution of scores on this assignment had a mean of 9.2 points and a standard deviation of 2.1 points. Would it be appropriate to use a Normal distribution to calculate the proportion of students who scored below 7 points on this assignment? Explain.

No, on a normal curve, the amount of scores within 1 SD should be 68% of the scores, meaning 16% of the scores should be higher than the first deviation. If the mean score is 9.2 and the SD is 2.1, it would be impossible to have 16% of the scores be higher than the first deviation (11.3) because the max score is 10.

Chapter 2 FRAPPY!

Directions: Show all your work. Indicate clearly the methods you use, because you will be scored on the correctness of your methods as well as on the accuracy and completeness of your results and explanations.

The distribution of scores on a recent test closely followed a Normal distribution with a mean of 22 points and a standard deviation of 4 points.

- (a) What proportion of the students scored at least 25 points on this test?

$$z = \frac{25 - 22}{4} = 0.75 = 0.7734$$

- (b) What is the 31st percentile of the distribution of test scores?

$$-0.50 = \frac{x - 22}{4}$$

$$-2.00 = x - 22$$

$$20 = x$$

Sample 2

- (c) The teacher wants to transform the test scores so that they have an approximately Normal distribution with a mean of 80 points and a standard deviation of 10 points. To do this, she will use a formula in the form:

$$\text{new score} = a + b (\text{old score})$$

Find the values of a and b that the teacher should use to transform the distribution of test scores.

$$10 = b(4) \text{ so } b = 2.5$$

$$80 = a + 22 \text{ so } a = 58$$

- (d) Before the test, the teacher gave a review assignment for homework. The maximum score on the assignment was 10 points. The distribution of scores on this assignment had a mean of 9.2 points and a standard deviation of 2.1 points. Would it be appropriate to use a Normal distribution to calculate the proportion of students who scored below 7 points on this assignment? Explain.

no, because the mean is too close to the maximum value of points. so, therefore, you can conclude the distribution is not normal.