

Algebra 2 Honors
Statistics Quiz #2

Name _____
Period _____ Date _____

Directions: Show the setup to each problem and represent all probabilities as a decimal rounded to three places when necessary.

A light bulb manufacturing company claims that a 100-watt bulb has a mean life of 750 h with a standard deviation of 70 h.

1. Sketch and label a bell-shaped curve using the Empirical Rule (Label the numbers and percentages).

2. What is the percent of light bulbs that have a life between 610 hours and 820 hours?

3. Between which two numbers do 68% of the life-spans lie?

4. Two students take tests. Which student has the highest relative score? Use z-scores to justify your answer.

Student 1 scores 144 on a test with a mean of 128 and standard deviation of 34.

OR

Student 2 scores 18 on a test with a mean of 15 and standard deviation of 5.

The age of best actress winners for the Oscars is bell-shaped with a mean age of 36 with a standard deviation of 11.5

5. Find the z-score for an actress who wins at age 55.

6. Find Helen Mirren's age when she won an Oscar. At the time, her z-score was 2.17.

7. Sketch then find the indicated area under the standard normal curve.

$$-1.4 < z < 1.4$$

Area _____

8. Find the indicated probability.

$$P(z > -2.15) = \underline{\hspace{2cm}}$$

9. Find the z-score representing the 9th percentile.

10. If x is a normally distributed random variable with mean μ and standard deviation σ , then what is the probability that $x > \mu$?

The resting heart rate for an adult horse should average about $\mu = 46$ beats per minute with a standard deviation of 12 beats per minute. Assume that this distribution is approximately normally distributed.

11. What is the probability that the heart rate is more than 60 beats per minute?

12. A horse that has a heart rate in the upper 10th percentile may have a secondary infection or illness that needs treatment. What is the heart rate that corresponds to the upper 10% cutoff?

13. If $P(x < 17) = 0.8413$ and $P(x > 24) = 0.0228$, what are μ and σ ?