Algebra 2

9-01 Using Normal Distributions

Normal Distribution

A normal distribution is modeled by a _____-shaped curve called a _____
curve that is symmetric about the _____.

Normal Distribution Properties

- A normal distribution with mean *μ* and standard deviation *σ* has the following properties:
- 1. The total area under the related normal curve is _____.
- 2. About ______ of the area lies within _____ standard deviation of the mean.
- 3. About ______ of the area lies within _____ standard deviations of the mean.
- 4. About ______ of the area lies within _____ standard deviations of the mean.

A normal distribution has mean and standard deviation. For a randomly selected *x*-value from the distribution, find $P(\mu - \sigma \le x \le \mu + 3\sigma)$

 $P(x \le \mu - \sigma)$

The weight of strawberry packages is normally distributed with a mean of 16.18 oz and standard deviation of 0.34 oz. If you randomly choose a container, what is the probability that it weighs less than 15.5 oz?

 $\mu = 33, \sigma = 4, \text{ find } P(29 \le x \le 37)$



- Normal distribution with mean = ____ and standard deviation = ____
- Formula = $z = \frac{x-\mu}{\sigma}$



• The *z* value for a particular *x*-value is called the ______ for the *x*-value and is the number of ______ the *x*-value lies above or below the ______ \bar{x} .

A survey of 20 colleges found that the average credit card debt for seniors was \$3450. The debt was normally distributed with a standard deviation of \$1175. Find the *z*-score corresponding to an x-value of \$3600.

 $\sigma = 34$, *z*-score = -1.5, *x* = 138 what is μ ?

Skewed

- Normal distribution: mean _____ median
- Skewed distribution: mean _____ median
- If mean < median, skewed _____
- If mean > median, skewed _____

Determine whether each histogram has a normal distribution.





mean

Bell-shaped and

470 #1, 3, 5, 7, 9, 11, 13, 15, 17, 18, 19, 23, 24, 33, 37, 39, 41, 43, 45, 47 = 20

median

median

Skewed right

mean

mean

Skewed left