Time Frame: 50 minutes

Subject Matter: Finding Data Values Given Specific Probabilities TELL ME

Objective: TSWBAT determine if a given data is approximately normally distributed using Pearson’s index of skewnes PI and checking for outliers.

Standards: DA – 4.8

 Materials: PowerPoint Presentation, Calculator, and Worksheets

SHOW ME

Presentation of Information:

The teacher will discuss the following problems.

There are several ways statisticians check for normality.

1. The easiest way is to draw a histogram for the data and checked its shape.
2. Skewness can be checked by using the Pearson’s index of skewness PI. The formula is $PI= \frac{3\left(\overbar{x}- median\right)}{σ}$. If the index is greater than or equal to 1 or less than or equal to – 1, it can be concluded that the data is significantly skewed.
3. The data should be checked for outliers. If there are two or more, then reject normality.

Example :

A survey of 18 high-technology firms showed the number of days’ inventory they had on hand. Determine if the data are approximately distributed.

5 29 34 44 45 63 68 74 74

81 88 91 97 98 113 118 151 158

*Source: USA TODAY*

Classwork

1. The data shown consist of the number of games played each year in the career of Baseball Hall of Famer Bill Mazeroski. Determine if the data is approximately distributed.

81 148 152 135 151 152

159 142 34 162 130 162

163 143 67 112 70

 *Source: Greensburg Tribune Review*

1. The data shown represent the number of outdoor drive-in movies in the United States for a 14 – year period. Check for normality.

2084 1497 1014 910 899 870 837 859

848 826 815 750 637 737

*Source: National Association of Theater Owners*

1. The data shown represent the cigarette tax (in cents) for 30 randomly selected states. Check for normality.

3 58 5 65 17 48 52 75 21 76 58 36

100 111 34 41 23 44 33 50 13 18 7 12

20 24 66 28 28 31

 *Source: USA TODAY*

1. The data shown represent the box office total revenue (in millions of dollars) for a randomly selected sample of the top-grossing films in 2001. Check for normality.

294 241 130 144 113 70 97 94 91 202 74 79

71 67 67 56 180 199 165 114 60 56 53 51

*Source: USA TODAY*

1. The data shown represent the number of runs made each year during Bill Mazeroski’s career. Cheek for normality.

30 59 69 50 58 71 55 43 66 52 56 62

36 13 29 17 3

1. The Federal Highway Administration reported the number of deficient bridges in each state. Cheek for normality.

15,458 1,055 5,008 3,598 8,984

1,337 4,132 10,618 17,361 6,081

6,482 25,090 12,681 16,286 18,832

12,470 17,842 16,601 4,587 47,196

23,205 25,213 23,017 27,768 2,686

7,768 25,825 4,962 22,704 2,694

4,131 13,144 15,582 7,279 12,613

810 13,350 1,208 22,242 7,477

10,902 2,343 2,333 2,979 6,578

14,318 4,773 6,252 734 13,220

*Source: USA TODAY*