Math 153 - Quiz 4

Name ___key___

September 24, 2015

Score _____

Show all work to receive full credit. Supply explanations when necessary.

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1. (6 points) The following numbers are the ages of the U.S. presidents at inauguration.

$$
\begin{array}{cccccccccc}
57 & 61 & 57 & 57 & 58 & 57 & 61 & 54 & 68 & 51 \\
49 & 64 & 50 & 48 & 65 & 52 & 56 & 46 & 54 & 49 \\
51 & 47 & 55 & 55 & 54 & 42 & 51 & 56 & 55 & 51 \\
54 & 51 & 60 & 62 & 43 & 55 & 56 & 61 & 52 & 69 \\
64 & 46 & 54 & 47 & & & & & &
\end{array}
$$

These are the ages of the U.S. vice presidents at inauguration.

$$
\begin{array}{cccccccccc}
53 & 53 & 45 & 65 & 68 & 42 & 42 & 50 & 56 & 50 \\
52 & 49 & 66 & 36 & 51 & 56 & 45 & 61 & 57 & 51 \\
65 & 64 & 57 & 52 & 42 & 52 & 53 & 58 & 48 & 59 \\
69 & 64 & 52 & 60 & 71 & 40 & 52 & 53 & 50 & 60 \\
66 & 49 & 56 & 41 & 44 & 59 & 66 & & &
\end{array}
$$

For each group, find the quartiles, the interquartile range, and the outlier cutoff values. Then construct and compare the modified boxplots, indicating outliers with asterisks.

PRESIDENTS

$Q_1 = 51$

$Med = 54.5$

$Q_3 = 57.5$

$IQR = 57.5 - 51 = 6.5$

Cutoffs:

$Q_1 - 1.5 \times IQR = 41.25$

$Q_3 + 1.5 \times IQR = 67.25$

68 & 69 ARE OUTLIERS.

VICE PRESIDENTS

$Q_1 = 49$

$Med = 53$

$Q_3 = 60$

$IQR = 60 - 49 = 11$

Cutoffs:

$Q_1 - 1.5 \times IQR = 32.5$

$Q_3 + 1.5 \times IQR = 76.5$

No outliers.

SEE ATTACHED SHEET FOR BOXPLOTS.

2. (2 points) Compute the z-score associated with the youngest president. Was that president unusually young?

$$\bar{X} = 54.659$$

$$S = 6.258$$

$$X = 42$$

$$Z = \frac{42 - 54.659}{6.258} \approx \boxed{-2.02} < -2$$

UNUSUAL

3. (2 points) Compute the z-score associated with the oldest vice president. Was that vice president unusually old?

$$\bar{X} = 54.255$$

$$S = 8.543$$

$$X = 71$$

$$Z = \frac{71 - 54.255}{8.543} \approx \boxed{1.96} < 2$$

NOT UNUSUAL.