# Box Plot

| LAST NAME | FIRST NAME | DATE |
|---|---|---|
| | | |

**1** (4 points). Suppose we are given a sample with mean $\overline{x} = 17$ and standard deviation $s = 6$.

(a) Compute the $z$-score for the data value 23.

(b) Compute the $z$-score for the data value 8.

(c) Assuming the distribution is approximately normal (symmetric and bell-shaped), which of the above data values is less likely? Explain.

(d) Find the data value with $z$-score $-2.5$.

**2** (4 points). Find the quartiles and the IQR for the sample

$$-14 \quad -12 \quad -12 \quad -12 \quad -8 \quad 2 \quad 5 \quad 5 \quad 6 \quad 9 \quad 10 \quad 11 \quad 15 \quad 20$$

(a) $Q_1$                                       (c) $Q_3$

(b) $Q_2$                                       (d) IQR

**3** (2 points). Consider the following sample data, sample size $n = 21$:

$$5 \quad 6 \quad 13 \quad 18 \quad 21 \quad 25 \quad 26 \quad 28 \quad 30 \quad 31 \quad 34 \quad 35 \quad 44 \quad 59 \quad 61 \quad 68 \quad 69 \quad 72 \quad 77 \quad 78 \quad 90$$

(a) Find the 33rd percentile of the sample data.

(b) 69 is which percentile of the sample data?

**4** (10 points). Consider the following sample data:

$$22 \quad 20 \quad 28 \quad 29 \quad 2 \quad 13 \quad 23 \quad 26 \quad 21 \quad 30$$

Sort the data:

Find the following statistics:

(a) first quartile

(e) lower fence

(b) median

(f) upper fence

(c) third quartile

(g) outliers (if any)

(d) IQR

Construct a box-and-whisker plot for the sample: