Homework due Feb. 18

Assigned exercises: Ch.2, OpenStax book, pg. 149-150, ex. 88, 89. And
from linked supplement: 14, 15a, 17, 20, 23, 25, 28, 39, 43. (11 exercises total)
Graded exercises: From linked supplement: 14, 17, 23, 25, 39.
Total (maximum) possible points = 20.
3 pt for each of 5 graded problems, plus 5 for completion of the rest.
−1 pt for each (ungraded) missing problem; if a graded problem is missing, student loses the 3 points allotted to it.

Exercises from linked supplement

(14) (a) Is not graded. But, a reasonable answer would be bimodal, because there are likely some children and some parents at the game.

(b) Answer: unimodal, with right skew. Reason: Many people likely have 0 or 1 (or maybe 2?) siblings. The number of people with larger numbers of siblings will be much smaller than those with fewer

(c) Answer: unimodal, symmetric. Reason: Most people likely have pulse rates close to the mean, with roughly equal numbers deviating above and below that value.

(d) Answer: uniform distribution, symmetric. Reason: each face is likely to appear an equal number of times is we assume a fair die.

Grade: (a)=not graded, (b)=(c)=(d)=1 pt.
For each, 0.5 pt =correct answer; 0.5 pt = some attempt at giving a reason.

(17) (a) From the histogram, the first 2 bars correspond to sizes between 0 and 60 acres. The heights of those bars are, respectively, 15 and 13. Total = 28.
Thus, 28 of the 36 vineyards are under 60 acres in size. Answer: $\frac{28}{36} \cdot 100 = 77.8\%$.

(b) The distribution of sizes of the 36 vineyards is unimodal and skewed to the right. The median size appears to be around 30-40 acres. {NOTE: It is okay to give any reasonable estimate for the center.} The vineyards range in size from less than 30 acres, to about 240 acres. There appears to be a high outlier at around 240 acres.

Grade: (a)=1 pt, (b)=2 pt.
For (a): 0.5 pt =correct answer; 0.5 pt = some reasoning.
For (b): 1 pt = description includes some reasonable summary of shape, center, and spread + 1 pt = written in complete sentences, with context and units.

(23) The given 9 numbers written in ascending order are:

120, 120, 130, 140, 150, 150, 150, 160, 180 (units = \$)

(a) Median = 5th value = \$150 (answer)

(b) The quartiles are: Q1=3rd value = \$130 Q3 = 7th value = \$150
{NOTE: It's okay if you got Q1=(120+130)/2=125 and Q3=(150+160)/2=155}

(c) Range $= 180 - 120 =$ $\boxed{\$60}$ IQR $=$ Q3$-$Q1 $=$ $\boxed{\$20}$

Grade: (a)=(b)=(c)=1 pt.
For each, 0.5 pt =correct answer + 0.5 pt = some step(s) or reasoning.

(25) (a) Assuming the boss's salary is the highest, the error will not affect the median. But it will cause the mean to be higher. Reason: The central value in ordered data is unaffected by increasing the maximum. But the mean adds all the values, so it will be affected.

(b) The IQR will remain the same. The range and standard deviation will increase. Reason: The central 50% of values in ordered data are unaffected by increasing the maximum. So the IQR remains the same. But increasing the maximum will change the range and SD.

Grade: (a)=(b)=1.5 pt.
For each, correct answer is sufficient for full credit.

(39) Given information is

employee type	how many	salary ($)
supervisor	1	1200
manager	1	700
drivers	4	500
stock boys	6	400

(a) Mean $= \dfrac{1200 + 700 + 6 \times 400 + 4 \times 500}{12} =$ $\boxed{\$525}$

Median = (6th+7th value)/2 = (400+500)/2 = $\boxed{\$450}$

(b) Only 2 employees make more than the mean wage.

(c) The median best describes a typical wage at the company, because this distribution has a high outlier.

(d) Is not graded. But, the answer is: the IQR would be the best measure of spread, because this distribution has a high outlier.

Grade: (a)=1 pt, (b)=(c)=0.5 pt each, plus 1 pt overall for steps/reason.
For (a): 0.5 pt = correct answer for mean, 0.5 pt = correct median.
For (b) and (c): 0.5 pt for each correct answer.
1 pt = some steps/reason shown; e.g., a frequency table, and/or written data values, and/or explain how the mean and median were found.