

Solutions for sample Q2:

1. Sample mean  $\bar{x}$ :

$$\bar{x} = \frac{\sum_{i=1}^7 x_i}{7} = \frac{16+7+2+2+10+11+(-6)}{7} = 6 \quad (1.C)$$

2. mode = 2 (2.B)

3. Find the sample standard deviation  $S$   
 We first find the Sample Variance  $S^2 = \frac{\sum (x_i - \bar{x})^2}{n-1}$

step 1. Set up a table to find  $\sum (x_i - \bar{x})^2$

$x_i$	$(x_i - \bar{x})^2$
16	$(16-6)^2 = 100$
7	$(7-6)^2 = 1$
2	$(2-6)^2 = 16$
2	$(2-6)^2 = 16$
10	$(10-6)^2 = 16$
11	$(11-6)^2 = 25$
-6	$(-6-6)^2 = 144$
$\Sigma = 318$	

step 2 Variance =  $S^2 = \frac{318}{7-1} = 53$

step 3 Standard deviation  $S = \sqrt{\text{Var}} = \sqrt{53} = 7.28 \quad (3.B)$

4. order the data:

-6, 2, 2, 7, 10, 11, 16  
 $r_1 \quad r_2 \quad r_3 \quad r_4 \quad r_5 \quad r_6 \quad r_7$

For the 25<sup>th</sup> percentile: Pos:  $L_p = \left(\frac{25}{100}\right)(7+1) = 2$   
 Value  $\Rightarrow Q_1 = r_2 = 2$

For the 50<sup>th</sup> percentile: Pos:  $L_p = \left(\frac{50}{100}\right)(7+1) = 4$   
 Value  $\Rightarrow$  median =  $Q_2 = r_4 = 7$

For the 75<sup>th</sup> percentile: Pos:  $L_p = \left(\frac{75}{100}\right)(7+1) = 6$   
 Value  $\Rightarrow Q_3 = r_6 = 11$

5 # summary: -6, 2, 7, 11, 16 (4.D)

5. Distribution shape: (8) (5)  
 Left-skewed (13) (9) (5.B)

6. Independent event  $P(A \cap B) = P(A) \times P(B) = .5 \times .8 = .4 \quad (6.A)$

7.  $P(A \cup B) = P(A) + P(B) - P(A \cap B) = P(F) + P(N) - P(F \cap N)$   
 $= \frac{104}{200} + \frac{90}{200} - \frac{54}{200} = \frac{140}{200} \quad (7.D)$

8.  $P(A|B) = P(N|F) = \frac{P(N \cap F)}{P(F)} = \frac{\frac{54}{200}}{\frac{104}{200}} = \frac{54}{104} \quad (8.C)$

9. 1 Standard deviation around the mean:  
 68% (9.A)