7.   The next 3 questions refer to the list {-13, -2, 10, -5, 5, 16, -3, 0}. Show your work where appropriate, for credit. (5 points total)

A.   What is the mean of this list? (show your work) (2 points)

$$\bar{x} = \frac{-13 + (-2) + 10 + (-5) + 5 + 16 + (-3) + 0}{8} = \boxed{1}$$

B.   What is the median of this list? (show your work) (2 points)

$$-13, -5, -3, -2 \mid 0, 5, 10, 16$$

$$\boxed{-1}$$

C.   What is the range? (show your work) (1 point)

$$16 - (-13) = \boxed{29}$$

$$(max - min)$$

8. The next 3 questions refer to this statement, but each question is separate (i.e. you can get the first one wrong and its result will not affect the others): You are on the verge of investing some of your hard-earned money in the stock market and you are examining two funds, let's call them A and B. Your investment adviser, I'll call him The Oracle, gives you some information on their performance (as measured by percentage returns over many, many days). Fund A has mean return of -3% with a standard deviation of 15%. It had a minimum of -78% and a maximum of 72%. Fund B has a mean return of 5% with a standard deviation of 2%. It had a minimum of -5% and a maximum of 15%. Assume both funds are normally distributed. SHOW YOUR WORK FOR FULL CREDIT.

A. You need to invest in a fund that spends as much time as possible giving returns in excess of 8%. Which fund is more likely to do this (7 points)
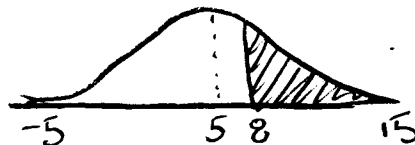
$$A \Rightarrow \text{mean} = -3 \quad SD = 15$$
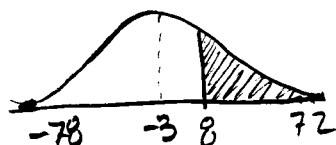
$$B \Rightarrow \text{mean} = 5 \quad SD = 2$$

$$z = \frac{8 - (-3)}{15}$$

$$= .733 \Rightarrow 54.67\%$$

$$\frac{100 - 54.67}{2} = 22.67\%$$

$$z = \frac{8 - 5}{2}$$

$$= 1.5 \Rightarrow 86.64\%$$

$$\frac{100 - 86.64}{2} = 6.68\%$$

∴ Fund A is more likely to spend as much time as possible giving returns in excess of 8%

B. Oracle says you know what? You need to take inflation into account in all of your calculations. So subtract 4% (professor: just subtract 4, don't worry about the percentage sign) from all of the returns and then multiply by 2. So for example, on a given day, Fund A returned –11%, so following Oracle's instructions subtracting 4 yields –15% and multiplying by 2 yields –30%. If you do this, what are the new mean, median, and standard deviations for funds A and B? (6 points)

$$\text{Fund A} \rightarrow \quad \underset{\text{mean}}{-3} \quad \underset{\text{SD}}{15} \qquad \underset{\text{new mean}}{\boxed{-14}} \qquad \underset{\text{new SD}}{15 \cdot 2 = \boxed{30}}$$

$$(-3-4)2 = \nearrow$$

$$\text{FUND B} \rightarrow \quad \underset{\text{mean}}{5} \quad \underset{\text{SD}}{2} \qquad 2 \cdot 2 = 4$$

$$(5-4)2 = 2 \qquad \qquad \text{mean} = \text{median}$$

FUND A	FUND B
New mean and median = –14	New mean and median = 2
New SD = 30	New SD = 4

C. Using only the information given at the beginning (i.e. ignore any additional information from parts A and B), is it possible to calculate the inter-quartile range for Fund A? If yes, please calculate the IQR for this fund. If no, please write "not calculable" in the space below and explain verbally why it is not calculable. (7 points)

$$\text{IQR} \qquad Q_3 - Q_1$$

$$75\text{th} - 25\text{th} = 50\text{th}$$

$$.65 = \frac{X - (-3)}{15}$$

$$X = 12.75$$

$$-.65 = \frac{X - (-3)}{15}$$

$$X = -6.75$$

$$Z = -.65 \qquad .65 = Z$$

$$25\% \quad 50\% \quad 25\%$$

$$12.75 - (-6.75) = \underline{19.5}$$

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