

HW 2.1 Part B pg 107-109 # 19, 21, 23, 31, 33-38

(19) a) mean =  $69.188 + 18in = 87.188in$

median =  $69.5 + 18in = 87.5in$

The distribution of heights shift by 18 inches

b) standard deviation = 3.20 in

new  $Q_3 = 71 + 18in = 89in$

new  $Q_1 = 67.75 + 18in = 85.75in$

new IQR =  $89 - 85.75 = 3.25in$

Orig IQR =  $71 - 67.75 = 3.25in$

The standard deviation and IQR do not change. The distribution has shifted, but the shape stays the same, hence standard deviation and IQR stay the same.

(21) a) To convert height from inches to feet, we  $\div$  each observation by 12.

mean =  $69.188 / 12 \approx 5.77ft$

median =  $69.5 / 12 \approx 5.79ft$

b) IQR =  $Q_3 - Q_1$

IQR =  $71/12 - 67.75/12 = \frac{71-67.75}{12} - \frac{3.25}{12} \approx 0.27ft$

standard deviation =  $3.20 / 12 \approx 0.27ft$

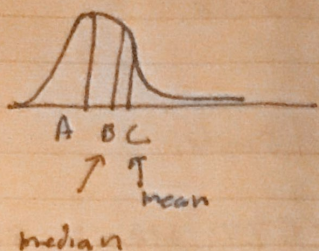
(23) mean =  $25^\circ C$  standard deviation =  $2^\circ C$   $F^\circ = (9/5)C^\circ + 32$

mean F =  $9/5(25) + 32 = 77^\circ F$

Standard deviation does not change when a constant  $k$  is added or subtracted but it does change when multiplied or  $\div$  by a factor.

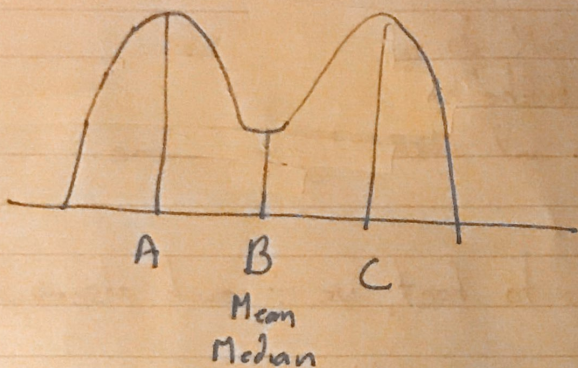
standard deviation =  $2^\circ (9/5) = 36^\circ F$

(31) a)



Mean is at C.  
Median is at B

b)



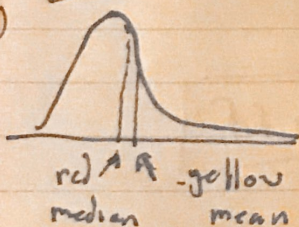
B is both the mean and median since the density curve is symmetric

(33)

C

64th percentile is between median and  $Q_3$

3.4



B

(36) George: mean = 180

League: mean = 150 s.d. = 20

$$z = \frac{180 - 150}{20} = \frac{30}{20} = 1.5$$

Bill: mean 190

His League: mean = 160 sd = 15

$$-z = \frac{190 - 160}{15} = \frac{30}{15} = 2$$

Bill ranks higher **B**

3) mean = 18 s.d. = 6

$$z = -0.7$$

$$-0.7 = \frac{x - 18}{6}$$

$$-4.2 = x - 18$$

$$+18 \quad +18$$

$$x = 13.8$$

C

(37) **D** when you add a constant, s.d. does not change

(38) **E** variance is (standard deviation)<sup>2</sup> so the variance is multiplied by  $10^2 = 100$ .