2.1 A HW   #'s 1, 5, 7 (A+B), 9, 11, 13

1

FEMALES		MALES
	0	4 5 5 5 6 7 7 7 7 8
9 5 3 3 3	1	0 0 0 0 1 2 4
6 6 4 3 3 2	2	2
8 4 1 0	3	5 8
9	4	
7 1 0 0	5	

a) THE GIRL WITH 22 SHOES IS THE 6TH SMALLEST.
- HER PERCENTILE IS .25 (6/20).
- 25% OF THE GIRLS HAVE FEWER THAN 22 SHOES.

b) THE BOY WITH 22 SHOES IS THE 3RD LARGEST.
- HIS PERCENTILE IS .85 (1 − 3/20 (.15)).
- 85% OF THE BOYS HAVE FEWER THAN 22 SHOES

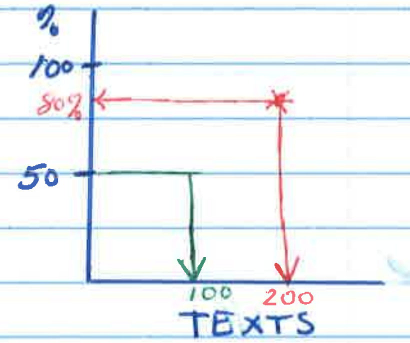
c) THE BOY IS MORE UNUSUAL SINCE 15% OF THE BOYS HAS MORE THAN 22 SHOES; WHILE 25% OF THE GIRLS HAVE FEWER THAN 22 SHOES.

5 Girl − 66 in tall (78th percentile)
118 lbs (48th percentile)

The girl weighs more than 48% of girls her age and is taller than 78% of girls her age. Since she is taller than 78% but only weighs more than 48% of girls her age she is probably taller and skinny compared to her peers

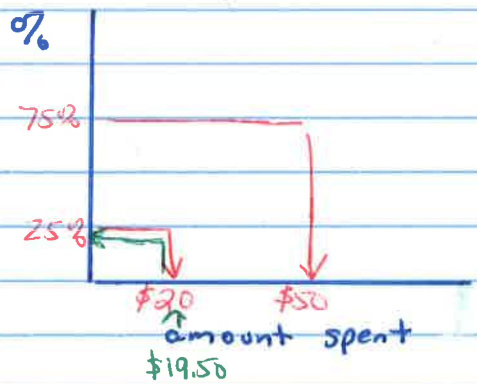
2.1 cont

(7) (a) The highlighted point is a student that text about 200 messages which places her at about the 80^{TH} percentile



(b) The median is the 50^{Th} percentile. BASED ON THE SKETCH OF THE GRAPH, the median is about 100 texts.

(9)



(a) The IQR is Q3 (75^{Th} percentile) − Q1 (25^{th} percentile) = Q3 (about \$50) − Q1 (about \$20) =

∴ SO THE IQR is ABOUT \$ 30.

(b) FOR THE Amount spent \$19.50, is about the 25^{TH} percentile

(11) ELEANOR Math SAT = 680 GERALD Math ACT = 27

$\mu = 500$
$\sigma = 100$

$\mu = 18$
$\sigma = 6$

$N(\mu, \sigma) = N(500, 100)$ $N(18, 6)$

ELEANOR $z = \frac{680 - 500}{100}$ GERALD: $z = \frac{27 - 18}{6}$

$\boxed{z = 1.8}$ $\boxed{z = 1.5}$

ELEANOR HAD A BETTER SCORE, since her standardized score was 1.8 while Gerald's standardized score was 1.5.

2.1 Cont

(13) Judy's bone density = 948 g/cm^2

$$z = -1.45$$

$$\mu = 956\ g/cm^2$$

(a) Judy has a standardize bone density $z = -1.45$ which means that her bone density is about one and a half standard deviations below the average score for all women her age, Judy's bone density is below average compared to her peers

(b) $\boxed{z = \frac{x - \mu}{\sigma}} \longrightarrow -1.45 = \frac{948 - 956}{\sigma}$

$$\frac{\cancel{-1.45}\,\sigma}{\cancel{-1.45}} = \frac{-8}{-1.45}$$

$$\boxed{\sigma \approx 5.52\ g/cm^2}$$

2.1B HW #'s 19, 21, 23, 31, 33-38

(19) (a) mean = 69.188 + 18 = 87.188 in
median = 69.5 + 18 = 87.5 IN

The distributions of heights shift by 18 inches

(b) std dev = 3.20 in
IQR = 71 − 67.75 = 3.25 in

The std dev and IQR do NOT change. The distribution has shifted but the shape remains the same. Hence the std dev + IQR stay the same.

(21) (a) To change the heights from inches to feet we divide each observation by 12.

mean = 69.188/12 ≅ 5.77 ft
median = 69.5/12 ≅ 5.79 ft

(b) IQR = Q3 − Q1
= 71/12 − 67.75/12 = 5.92 − 5.65 = 0.27 ft

Std dev = 3.2/12 ≅ .27 ft

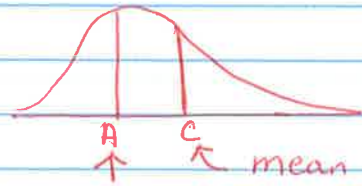
(23) mean = 25°C STD DEV = 2°C

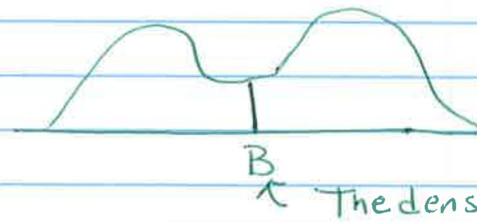
Convert °C → °F
mean = 9/5 (25) + 32 = 77°F
Std dev = 9/5 (2) = 3.6°F

NOTICE STD DEV is changed when mult/divide by a factor. It does NOT change when add/subtract constant

2.1 B HW (Cont)

(31) (a)

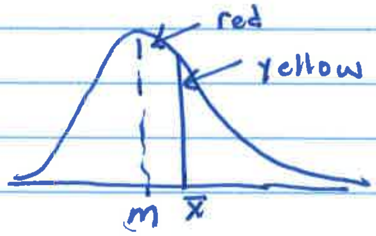




The density curve is symmetric so the mean and median are the same (B)

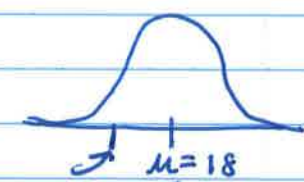
(33) 64^{Th} percentile between median + Q3 (C)

(34)



(b)

(35)



$Z = \frac{X - \mu}{6}$

$-.7 = \frac{X - 18}{6}$ (C)

$-4.2 = X - 18$

$X = 13.8$ Raw ACT Score

(36)

George	Bill
mean = 180	mean = 190
League	his league
mean = 150	mean = 160
STDDEV = 20	std dev = 15

$Z = \frac{180 - 150}{20}$ $\quad$ $Z = \frac{190 - 160}{15}$

$Z = 1.5$ $\quad$ (B) $\quad$ $Z = 2$ *

(37) (D) When you add a constant, the standard deviation does **NOT** change

(38) (e) variance is $(\text{std dev})^2$ so the variance is multiplied by $10^2 = 100$