Chapter 5 Exercise Set A

1a

60: $\frac{60-50}{10} = 1$

45: $\frac{45-50}{10} = -.5$

75: $\frac{75-50}{10} = 2.5$

1b

0 : $0(10)+50 = 50$
+1.5 : $1.5(10)+50 = 65$
-2.8 : $-2.8(10)+50 = 22$

2a

ave: 10
SD: 2

13: $\frac{13-10}{2} = 1.5$

9: $\frac{9-10}{2} = -.5$

11: $\frac{11-10}{2} = .5$

7: $\frac{7-10}{2} = -1.5$

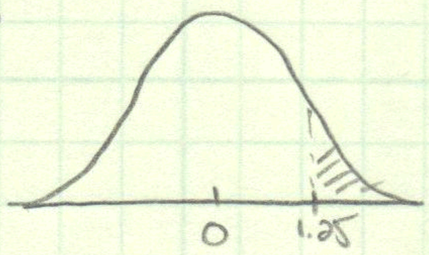
10: $\frac{10-10}{2} = 0$

2b

ave of $(1.5, -.5, .5, -1.5, 0) = 0$
SD : 1

Chapter 5 Exercise Set B

1a



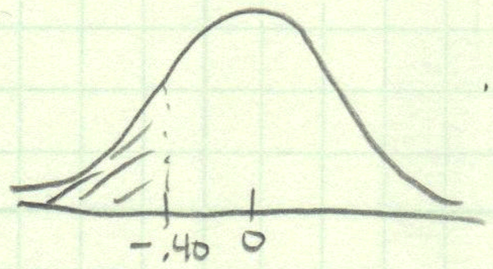
Table

$1.25 \approx 78.87\%$

Tail

$\frac{100 - 78.87}{2} = \boxed{10.565\%}$

1b



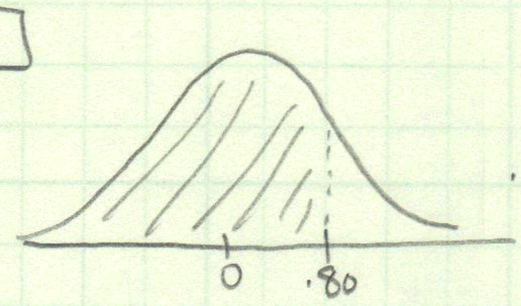
Table

$.40 \approx 31.08\%$

Tail

$\frac{100 - 31.08\%}{2} = \boxed{34.46\%}$

1c



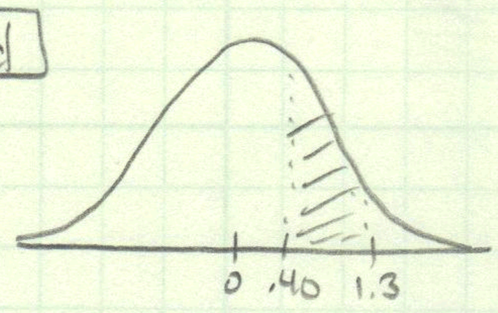
Table

$.80 \approx 57.63$

Middle + Tail!

$57.63 + \left(\frac{100 - 57.63}{2}\right) = \boxed{78.815\%}$

1d



Table

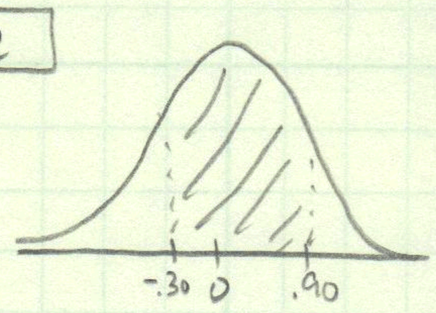
$.40 \approx 31.08\%$

$1.3 \approx 80.64\%$

Same Side!

$\frac{80.64}{2} - \frac{31.08}{2} = \boxed{24.78\%}$

1e



Table

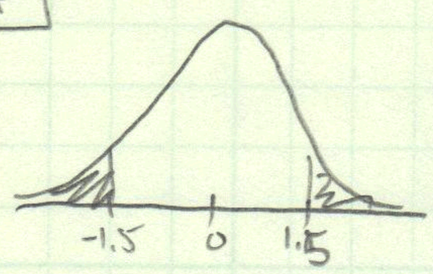
$.30 \approx 23.58$

$.90 \approx 63.19$

Opposites Attract

$\frac{63.19}{2} + \frac{23.58}{2} = \boxed{43.385\%}$

1f



Table

$1.5 \approx 86.64$

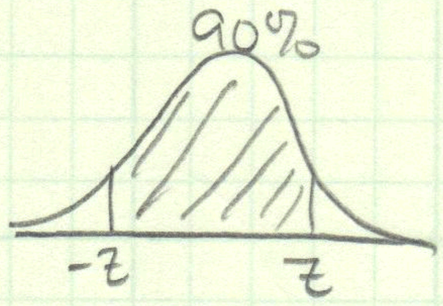
2 Tails

$100 - 86.64 = \boxed{13.36\%}$

2a 1 Standard Unit

2b 1.15 Standard Units

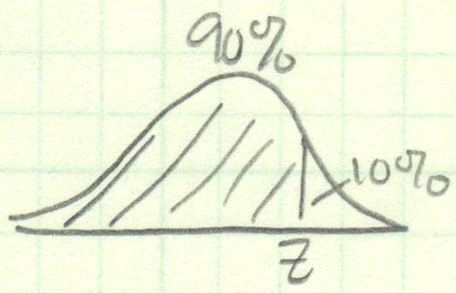
3a



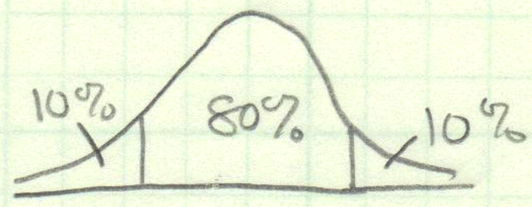
Table

$90\% \approx 1.65$

3b



Not the same!



Table

$80\% \approx 1.30$

4a If the area between 0 and 1 is 39% and there is 100% under the curve between 1 & 4 will be $(100-39) = \underline{61\%}$

4b Because it is skewed we cannot calculate this.

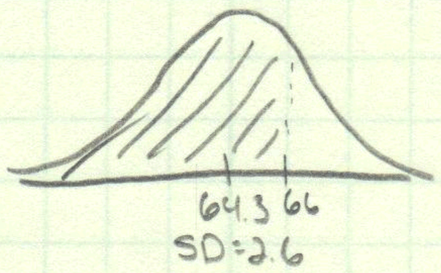
5a Since it is symmetric and we know between 1 and -1 is 58% by symmetry we can conclude that the area between 0 and 1 is $\frac{58}{2} = \boxed{29\%}$

5b Since we know from a that the percent between 1 and 0 is 29% and by symmetry that from 0 to the right = 50%, we can conclude that to the right of one is $50-29 = \underline{21\%}$

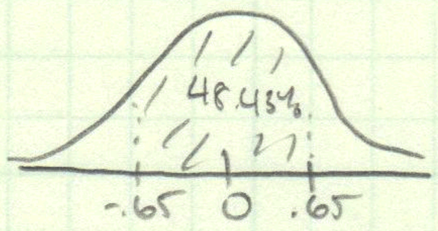
5c We cannot calculate this because it is not a normal approximation and we don't have any more pieces to "play" with as above.

Chapter 5 Exercise Set C

1a Data



Puzzle



z

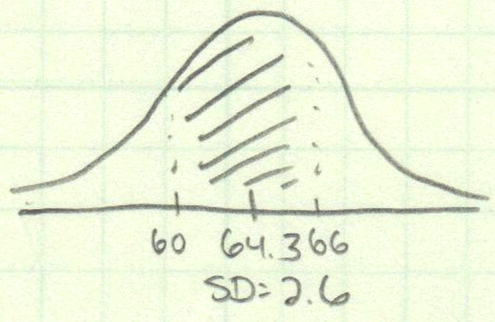
$$z = \frac{66-64.3}{2.6} = .65 \approx 48.43\%$$

Table

Middle Plus Tail!

$$48.43 + \left(\frac{100-48.43}{2}\right) = \boxed{74.215\%}$$

1b Data



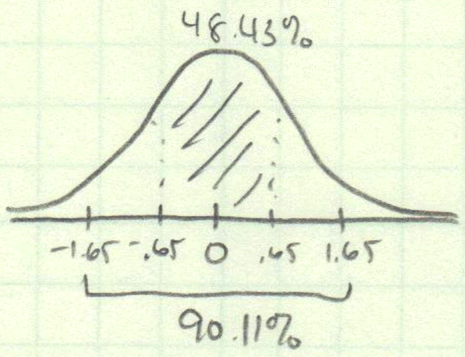
z

$$z = \frac{66-64.3}{2.6} = .65 \approx 48.43\%$$

$$z = \frac{60-64.3}{2.6} = -1.65 \approx 90.11\%$$

Table

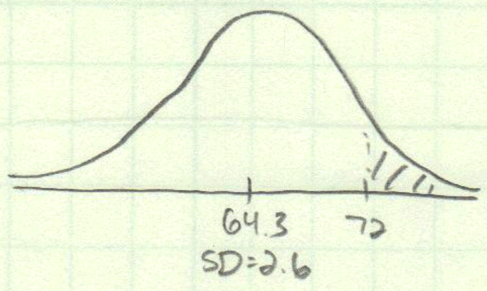
Puzzle



Opposites Attract

$$\frac{90.11}{2} + \frac{48.43}{2} = \boxed{69.27\%}$$

1c Data

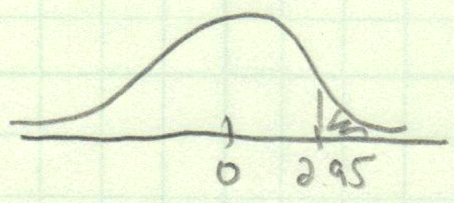


z

$$z = \frac{72-64.3}{2.6} = 2.96 \approx 2.95 \approx 99.68\%$$

Table

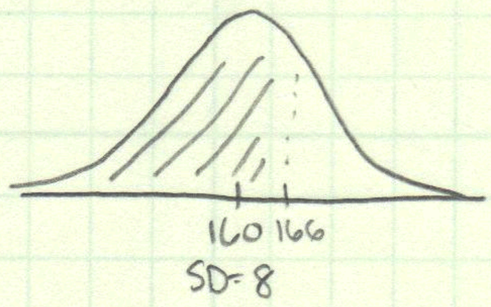
Puzzle



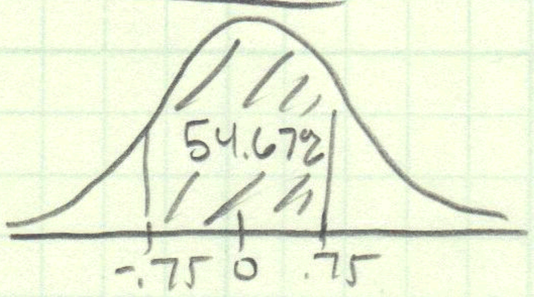
Tail

$$\frac{100-99.68}{2} = .16\%$$

2a Data



Puzzle



z

$z = \frac{166-160}{8} = .75 \approx$

Table

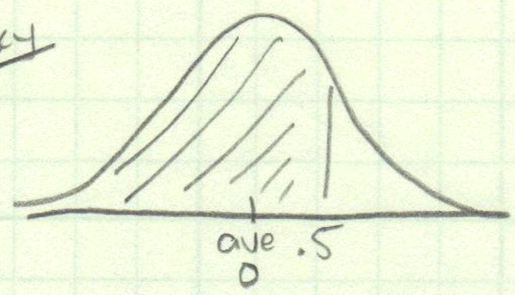
54.67%

Middle + Tail

$54.67 + \left(\frac{100-54.67}{2}\right) =$ **77.335%**

2b Data

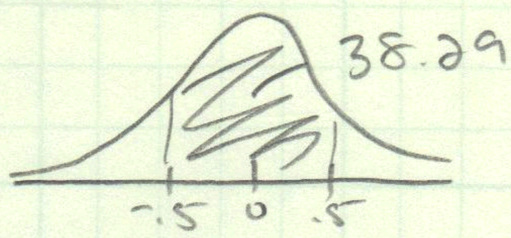
Tricky



Table

.5 ≈ 38.29%

Puzzle



Middle + Tail

$38.29 + \left(\frac{100-38.29}{2}\right) =$ **69.145%**

3 histogram (exact value)
normal curve (approximation)

Chapter 5 Exercise Set D

1a 75%

1b $29,000

1c 75% (Estimate) 15,000 ≈ 10th %ile
125,000 ≈ 85th %ile

85 - 10 = 75

2 5th; 95th

3 7,000 (1+2+3+4+5+5+5 = 25%)

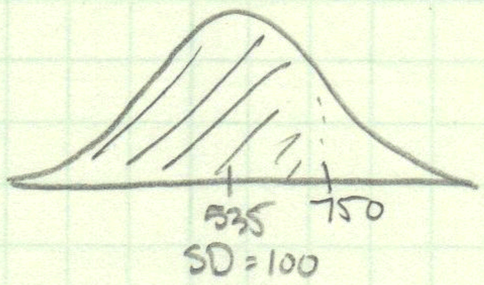
4 quite a bit smaller than 25 mm because looking from the left we want 25% of the area. which to the left of 25 mm will probably be more than 50%.

5a It doesn't smooth out as nicely as the normal curve. The tails are also really long!

5b 15; the interquartile is the 25%ile - 75th %ile which I estimate as 42.5 - 57.5 ☺

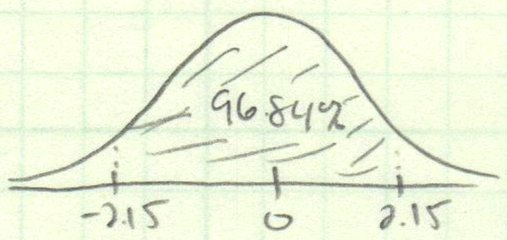
Chapter 5 Exercise Set E

1 Data → Z → Table



$$z = \frac{750-535}{100} = 2.15 \approx 96.84\%$$

Puzzle



Middle + Tail

$$96.84 + \left(\frac{100-96.84}{2}\right) = \boxed{98.42\% \text{ile}}$$

2 Percentile!

Puzzle

Find Middle Area

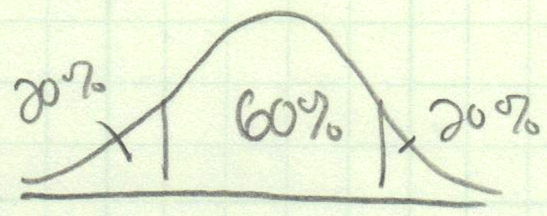


Table → Z

60% ≈ .85 (Positive)

$$.85 = \frac{x-535}{100} \quad \text{or} \quad x = .85(100)+535$$

$$\boxed{x = 620}$$

3 Percentile!

Puzzle

Find Middle Area

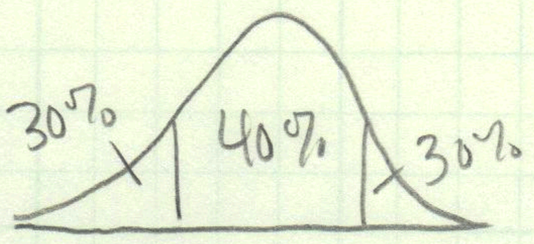


Table → Z

40% ≈ -.55 (Negative)

$$-.55 = \frac{x-3.0}{.5} \quad \text{or} \quad x = (-.55)(.5)+3.0$$

$$\boxed{x = 2.725}$$

Chapter 5 Exercise Set F

1a

$C° = \frac{5}{9}(F° - 32°)$

Ave: $\frac{5}{9}(98.6 - 32) = 37° C$

SD: $\frac{5}{9}(.3) = .167° C$ (Multiply by constant)

1b Converting to Standard Units will be the same on each scale! So the answer is 1.5!

Chapter 5 Review Exercises

1a Table

$1.25 \approx (78.87\%)25 \approx 20$ of the #'s should be ± 1.25 SD's of average.

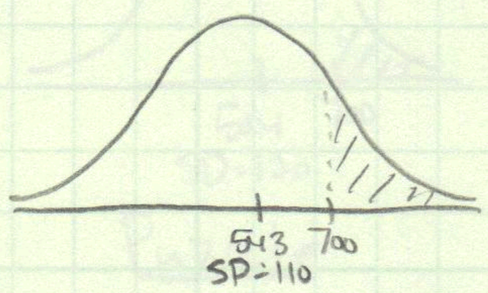
1b 1.25 above average = $x = 1.25(10) + 50 = 62.5$
1.25 below average = $x = (-1.25)(10) + 50 = 37.5$

14 actual numbers out of 25 sit in that range.

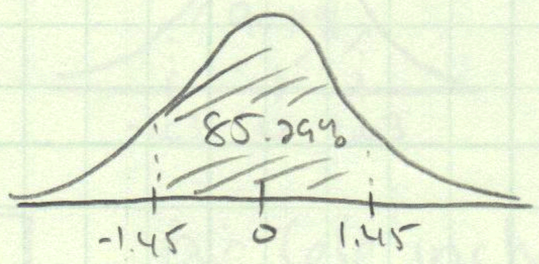
$18/25 = 72\%$ close!

2 Something is wrong. If these are Standard Units being listed we would expect to see most between ± 2.0, we definitely don't see that so something must be wrong.

3a Data



Puzzle



z

$$z = \frac{700-543}{110} = 1.43 \approx 1.45 \approx$$

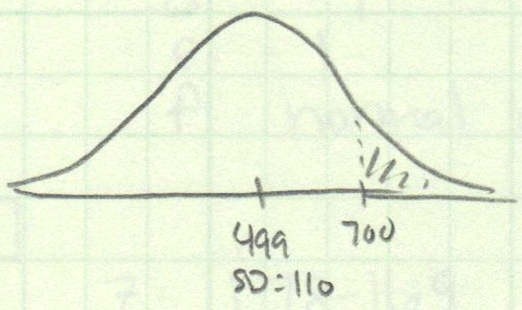
Table

85.29%

Tail!

$$\frac{100-85.29}{2} = \boxed{7.355\%}$$

3b Data



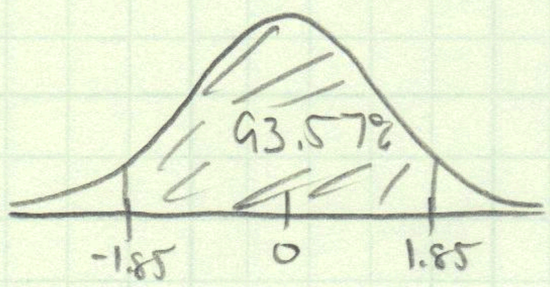
z

$$z = \frac{700-499}{110} = 1.83 \approx 1.85 \approx$$

Table

93.57%

Puzzle

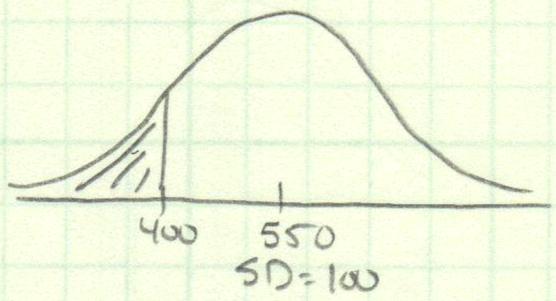


Tail

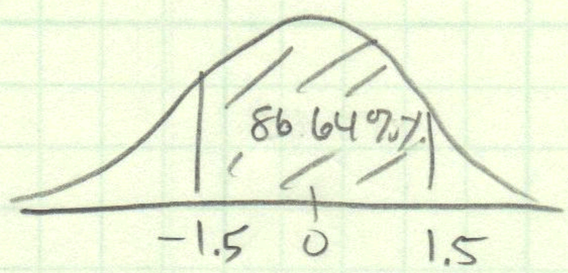
$$\frac{100-93.57}{2} = \boxed{3.215\%}$$

7a

Data



Puzzle



z

$$z = \frac{400-550}{100} = -1.5 \approx 86.64\%$$

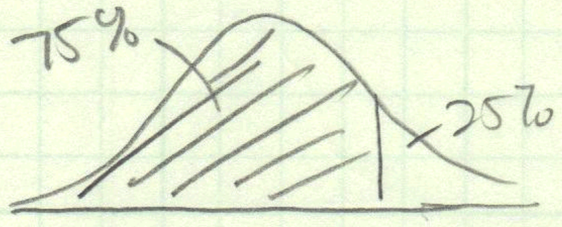
Table

Tail

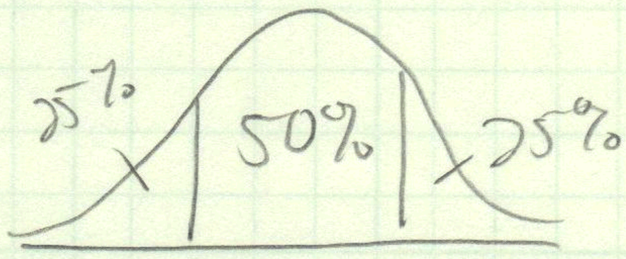
$$\frac{100-86.64}{2} = 6.68\%\text{ile}$$

7b

Puzzle



Find area in Middle



Table

50% ≈ .70 (Positive)

z

$$.70 = \frac{x-550}{100} \quad \text{or} \quad x = .70(100)+550$$

$$x = 620.$$

8a True

8b False Spread is constant

8c True

8d True

8e True

8f False (SD is always positive)

9a False The average could be very far from the median
1, 1, 1, 100 median = 1 ave = 25

9b False. Half a list is always below the median.

9c False. Some data cannot follow normal curve by nature like GPA.

9d False. There will be approximately the same percentage in both groups but not exactly the same.

10 From $37,000 and above would equal 50% taking away a 1/4 of a percent still leaves us with close to 50%.

11 Not a great question!

i is the proper choice because most people take one course of math in college and fewer take more and more which is right skewed like i.

12 Need more info for this!

Those that take a subject-matter test are those that apply for better schools and they have to be more competitive!