Agenda

Homework (reg)
Pg.122 #2.7(a), 2.8
Pg.131-132 #2.15, 2.19

- Warm Up
- Gallery Walk — 20 min
- Unit 2 summary, introduction
- Frequency vs. relative frequency — 15 min
- Density curves — 10 min
- Review Unit 1 tests — 10 min
  - *Update*
- Pop quiz ☺ on common mistakes — 5 min
  - *Copies*
- Hand back tests — 20 min
  - ~~*Update*~~
- Exit Pass — 5 min
  - ~~*Update*~~
- ~~*Copies of z-charts for Reg*~~

Warm Up

1. The five-number summary of your Unit 1 test scores are below. What does it mean to say that a score of 87.5% is "*at the 75th percentile*"? What is a 75th percentile?

0.58	**0.75**	**0.82**	**0.875**	**0.93**

2. The ages of people in a class (to the nearest year) are as follows. What is the median age?

Age	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
Frequency	14	120	200	200	90	30	10	3

Project #1 → "Gallery Walk"

- Doors
  - Stand around the room. Bring your project.
  - Answer questions.
- Windows
  - Speak to every Door, in any order.
  - Introduce yourself.
  - Ask them about…..
    - Their **topic**. What was it, and how did they collect data?
    - Their **graphs**. Which graph(s) did they choose, and why?
    - Their **data**. Anything weird/surprising/interesting?
- After ~5-10 minutes, I will tell you to switch.
- Interesting topics (not necessarily "best" project)

Chapter 2 summary

Test
Wed. 1/29

- Percentiles & z-scores for individual values within a distribution
- Density curves
- Normal distributions
- Proportions within a normal distribution
- Assess normality, esp. normal quantile plots

Chapter 2:
Location in a Distribution

Chapter 2:
Individuals within a distribution

- Chapter 1 → Describing sets of observations
- Chapter 2 → Describing individual observations

- Am I tall? How do you know?

- You get a test back. Your score is **95**. How do you feel?

IQ Range	Classifications
130+	Upper extreme
120–129	Well above average
110–119	High average
90–109	Average
80–89	Low average
70–79	Well below average
69 and below	Lower extreme

Notes

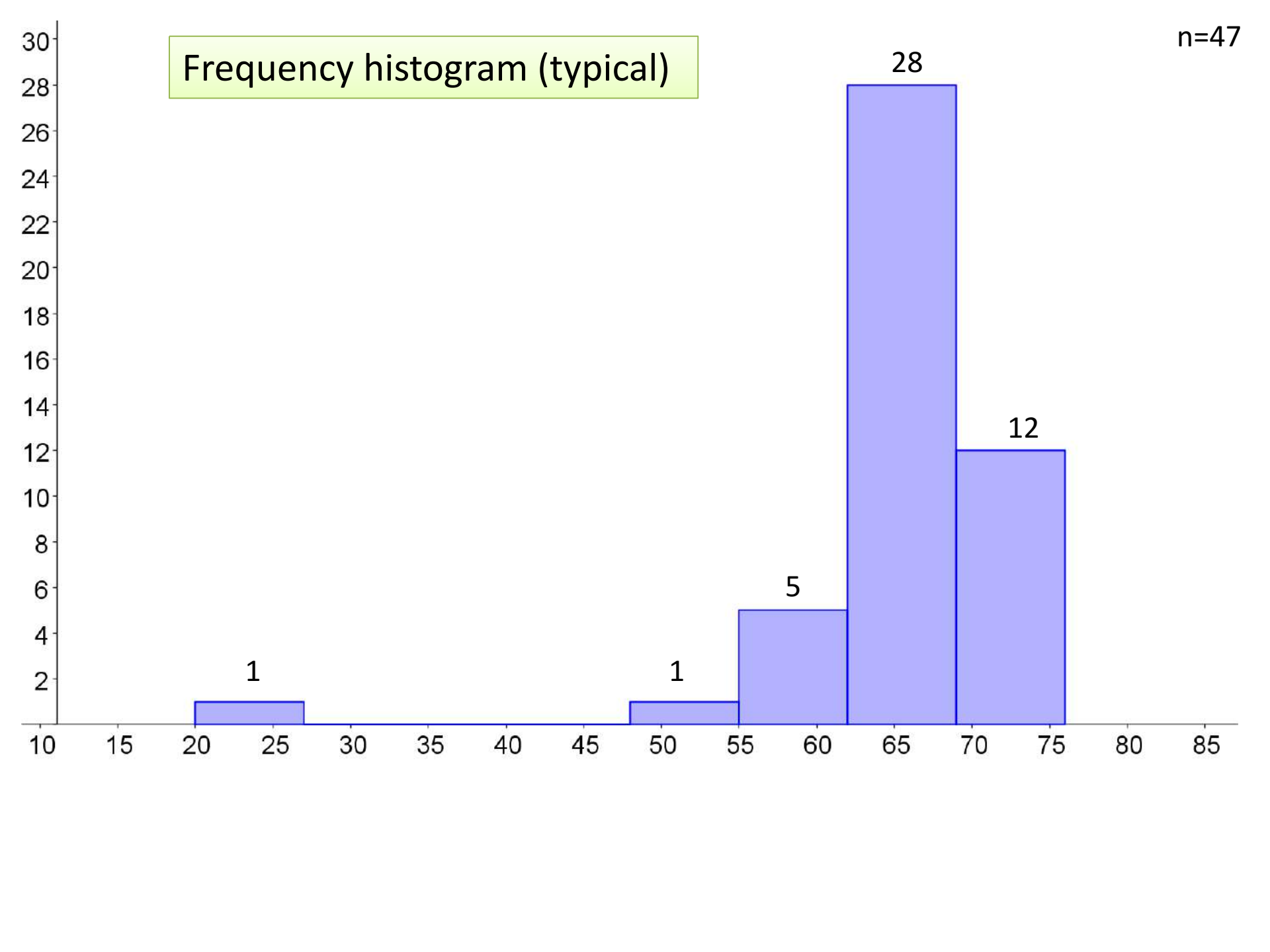
Frequency vs. Relative frequency (Histograms)

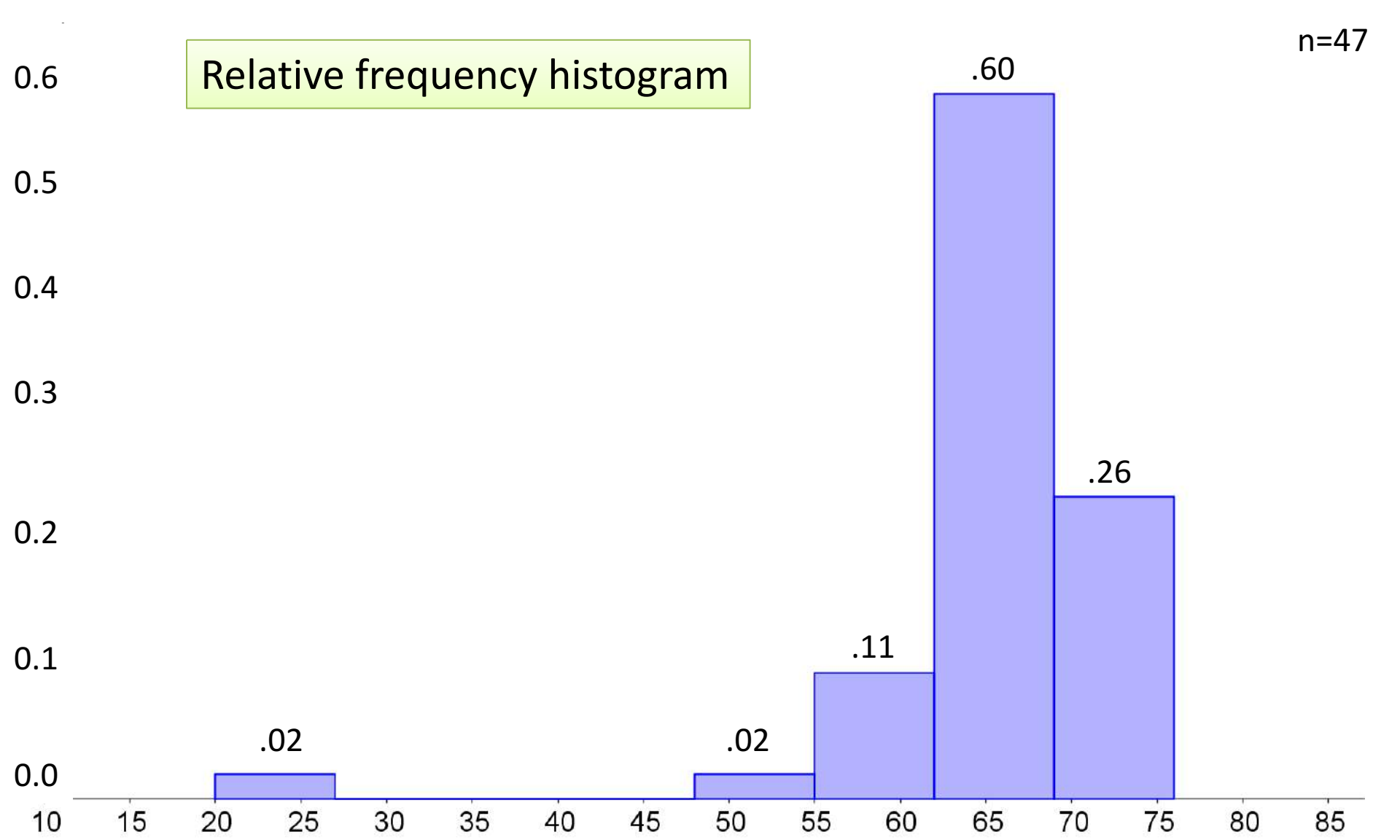
- **Frequency**
  - **Quantity (#) of data in a class**
- **Relative frequency**
  - **% of data that falls in a class**
  - Written in decimal form
  - Always adds up to 1 (or 100%)
- *Example. Heights in inches (Spring 2014 classes)*

Examples on next 2 slides

54
68
59
60
62
64
20
66
71
66
62
67
72
70
64
68
68
73
63
57
56
65

62
72
64
62
63
66
71
73
68
73
66
62
64
63
60
76
68.5
68
63
62
69
73
71
62
68


Frequency histogram (typical)
n=47
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
1
1
5
28
12
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85


Relative frequency histogram
n=47
0.6
0.5
0.4
0.3
0.2
0.1
0.0
.02
.02
.11
.60
.26
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85

You try

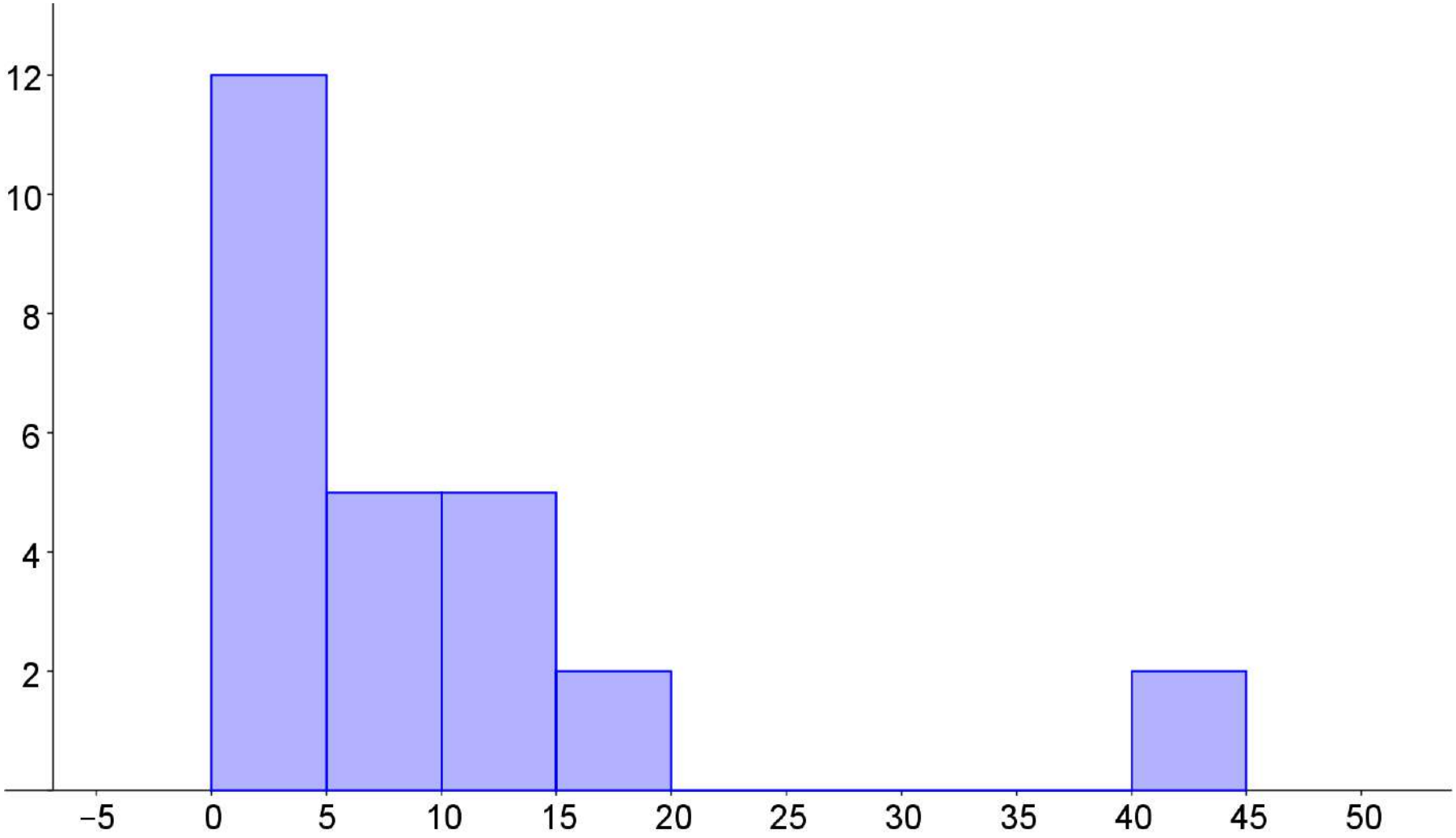
n=26

These are the average study times per week of my Spring class.

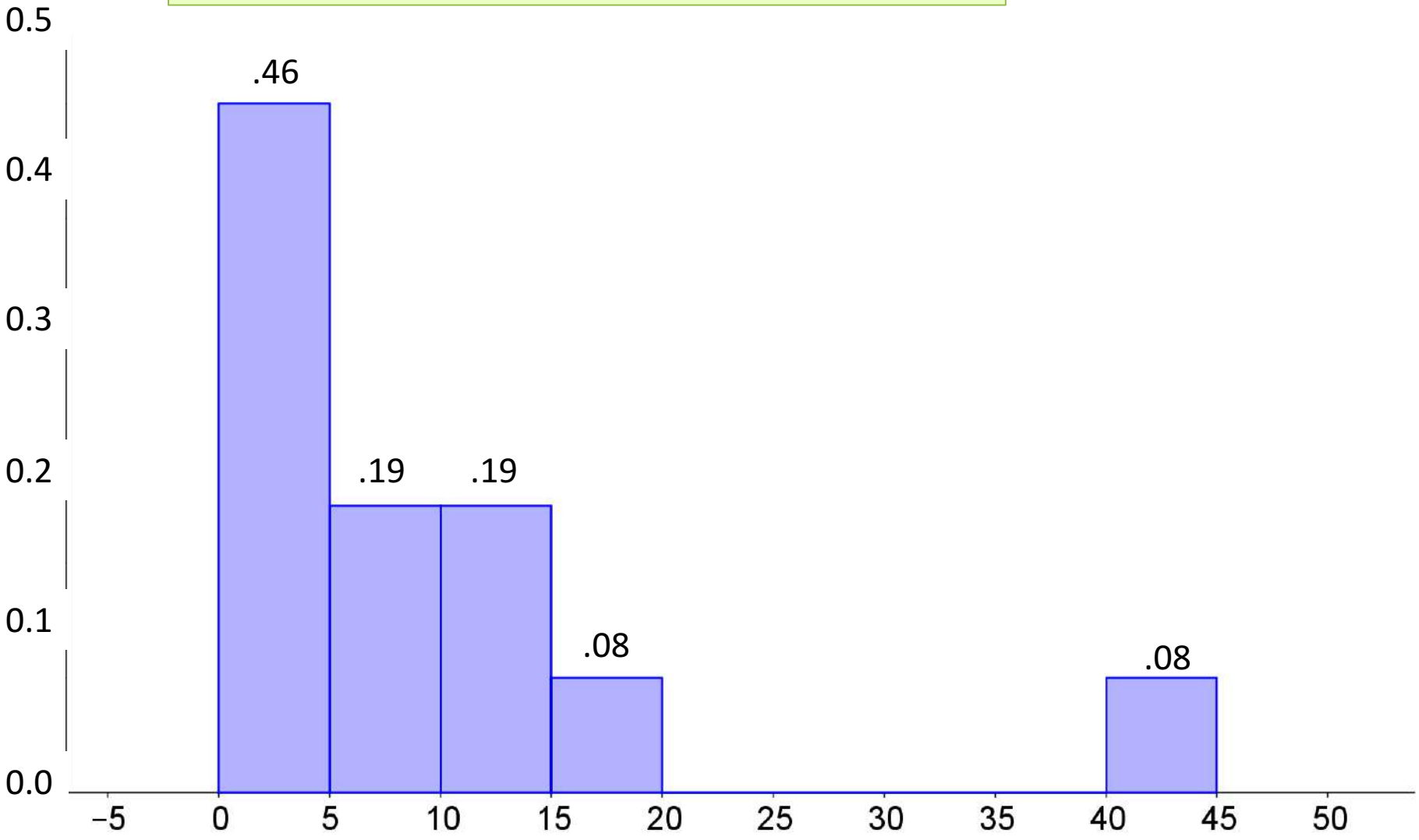
- Construct a relative-frequency histogram using ***9 classes***.

0
0
0.5
0.75
1
1
1
1.5
2
2
3
3
5
5
5
5.5
9
10
10
10
10
12
15
18
45
45

Frequency histogram (INCORRECT)



Relative frequency histogram (CORRECT)



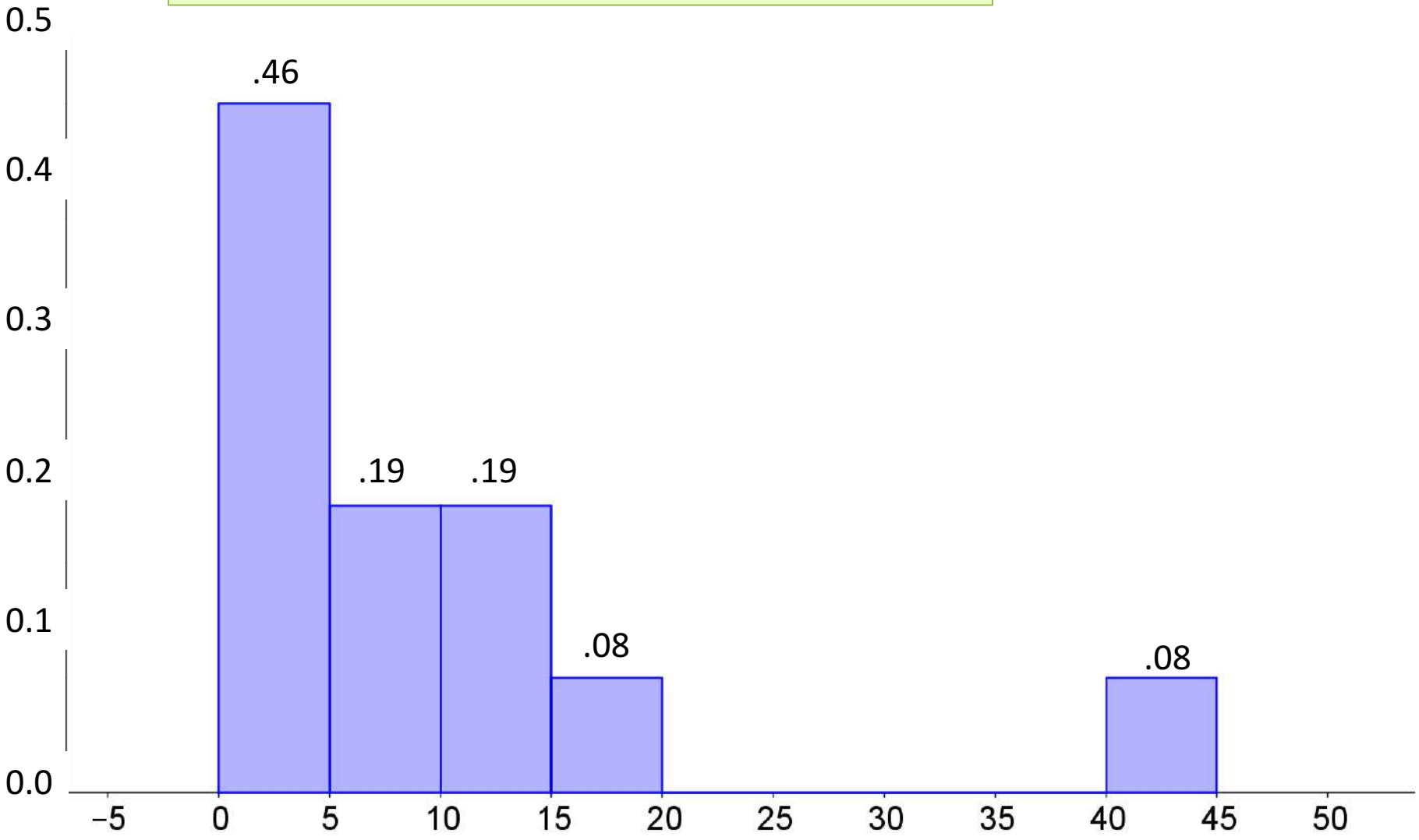
Density curve

- A relative-frequency histogram with a curve going through the (invisible) midpoint of each (invisible) bar

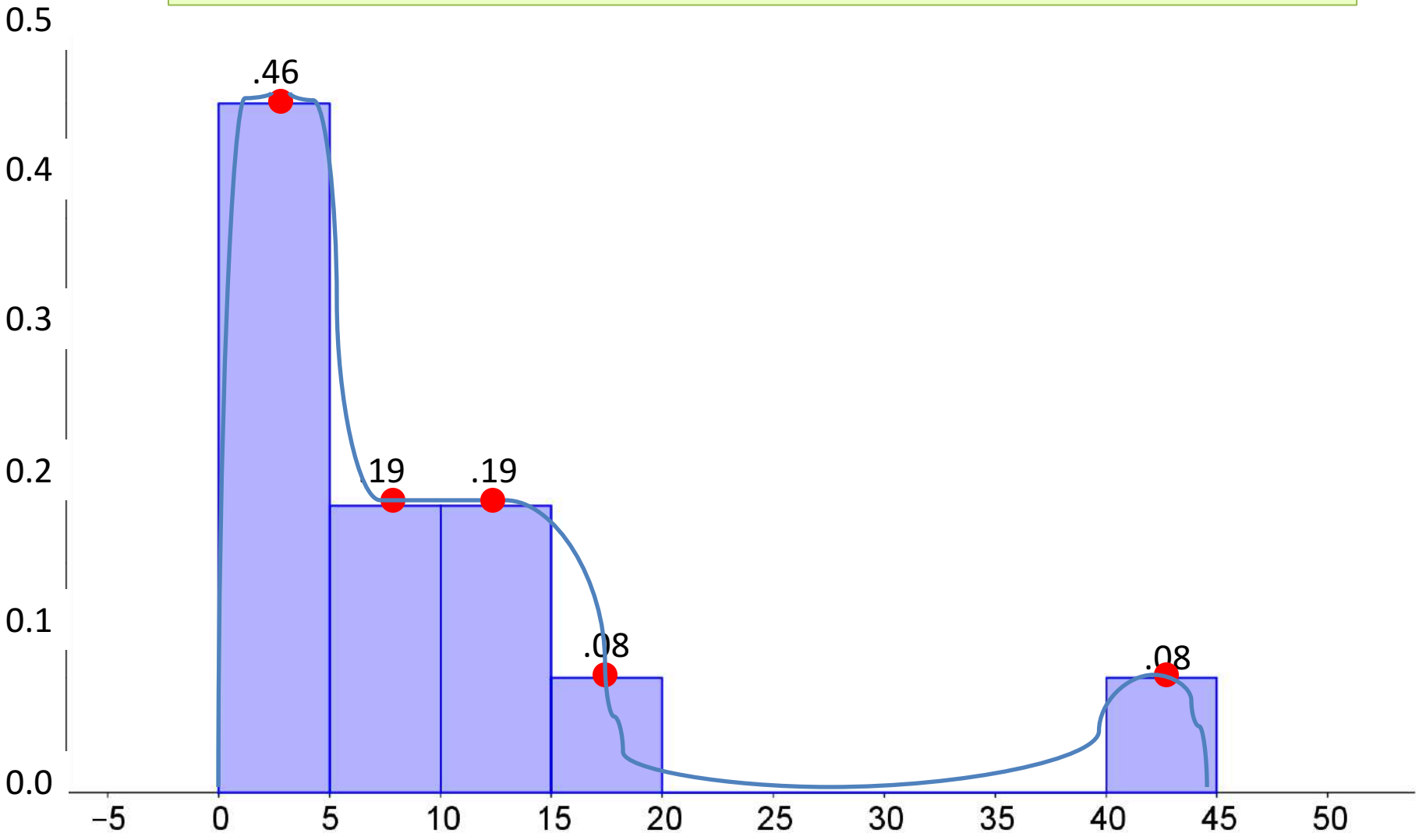
Area = 1 (or 100%)

- Useful for describing position of individuals within a distribution

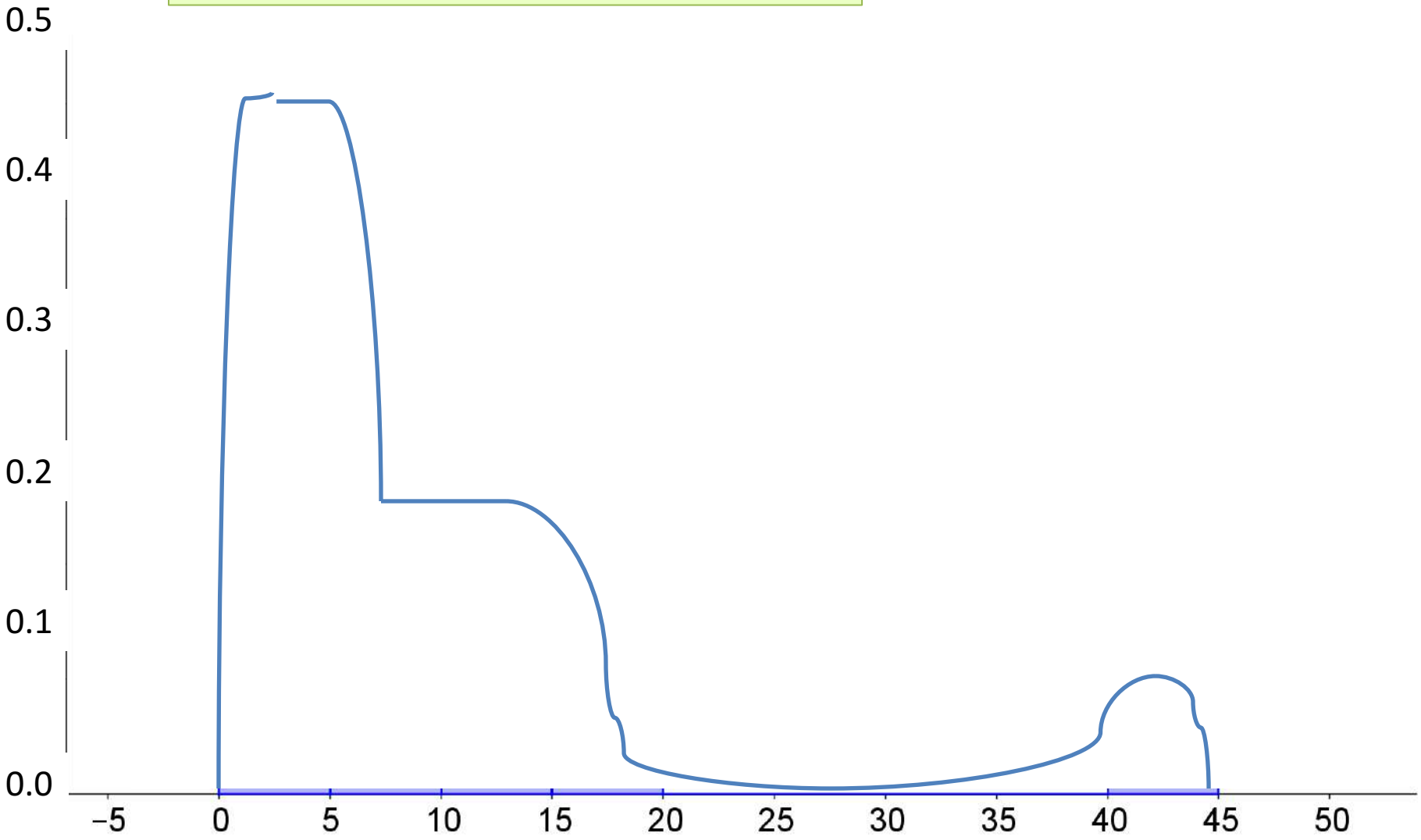
EXAMPLE. Relative frequency histogram.



EXAMPLE. Density curve with everything visible. (incorrect)



EXAMPLE. Density curve, correct.



Notes

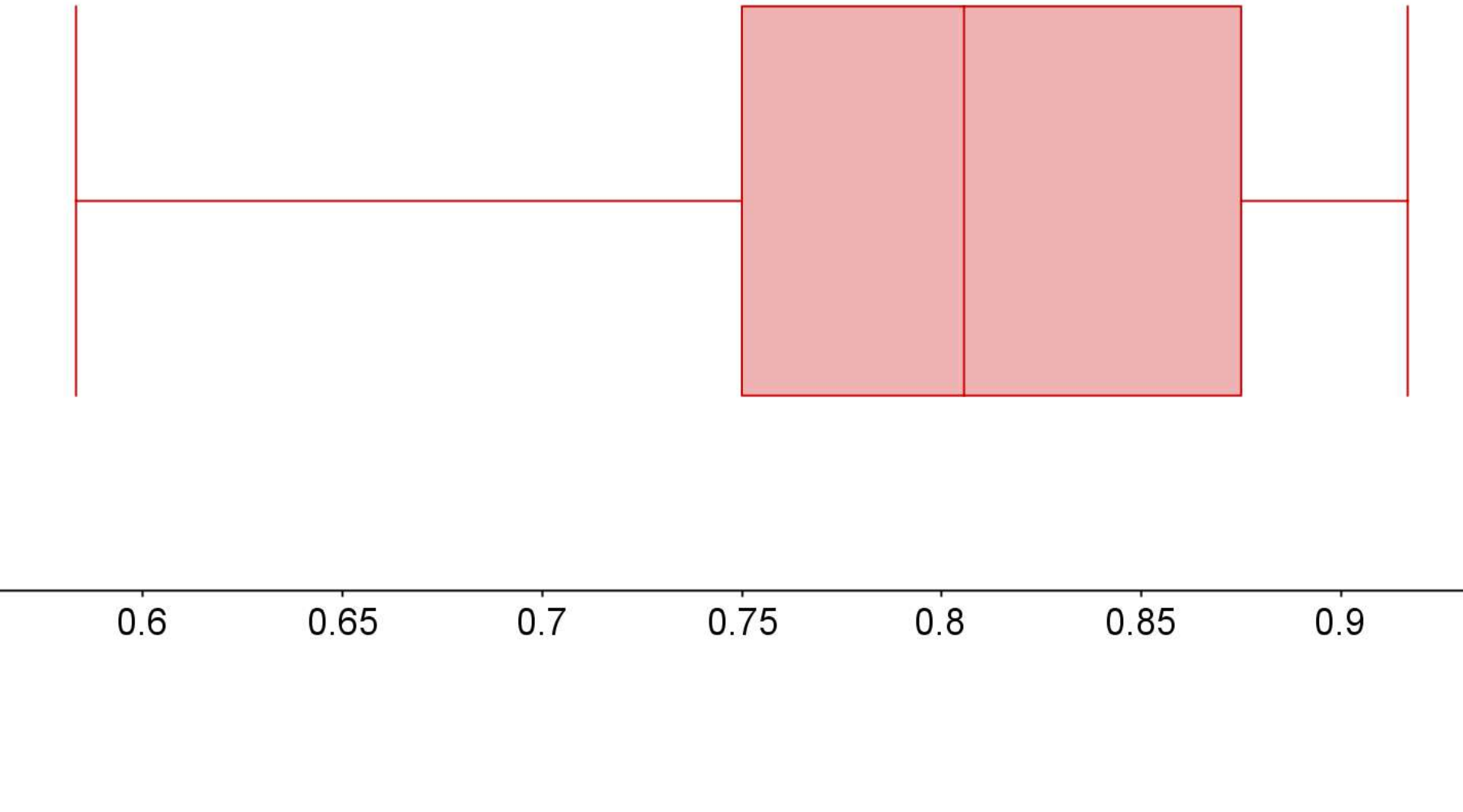
Z-scores (super-important)

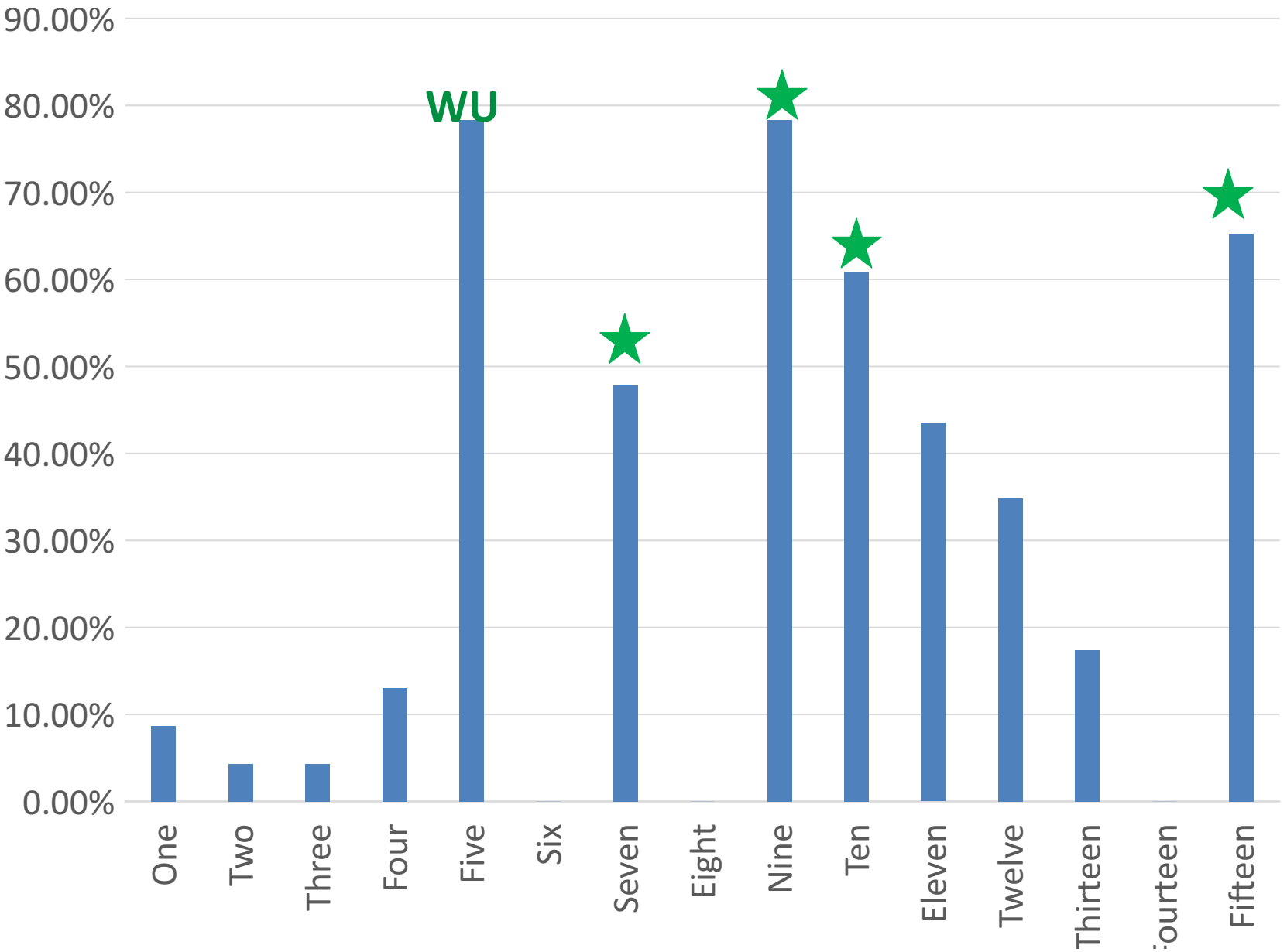
- The "z-score" of an individual is the number of standard deviations away from the mean.
- *The average American male weighs 170 pounds, with a standard deviation of 30 pounds. If I weigh 155 pounds, what is my z-score?*

$$z = \frac{(observation - mean)}{s.d.} \qquad z = \frac{(x - \bar{x})}{\sigma}$$

- Only with symmetric distributions. Why?

Common Mistakes: Unit 1 Test


0.6
0.65
0.7
0.75
0.8
0.85
0.9


90.00%
80.00%
70.00%
60.00%
50.00%
40.00%
30.00%
20.00%
10.00%
0.00%
WU
One
Two
Three
Four
Five
Six
Seven
Eight
Nine
Ten
Eleven
Twelve
Thirteen
Fifteen

7. Which of the following is likely to have a mean that is *smaller* than the median?

B) Scores on an easy exam in which most students score perfectly, but a few do very poorly.

D) Scores on a difficult exam on which most students score poorly, but a few do very well.

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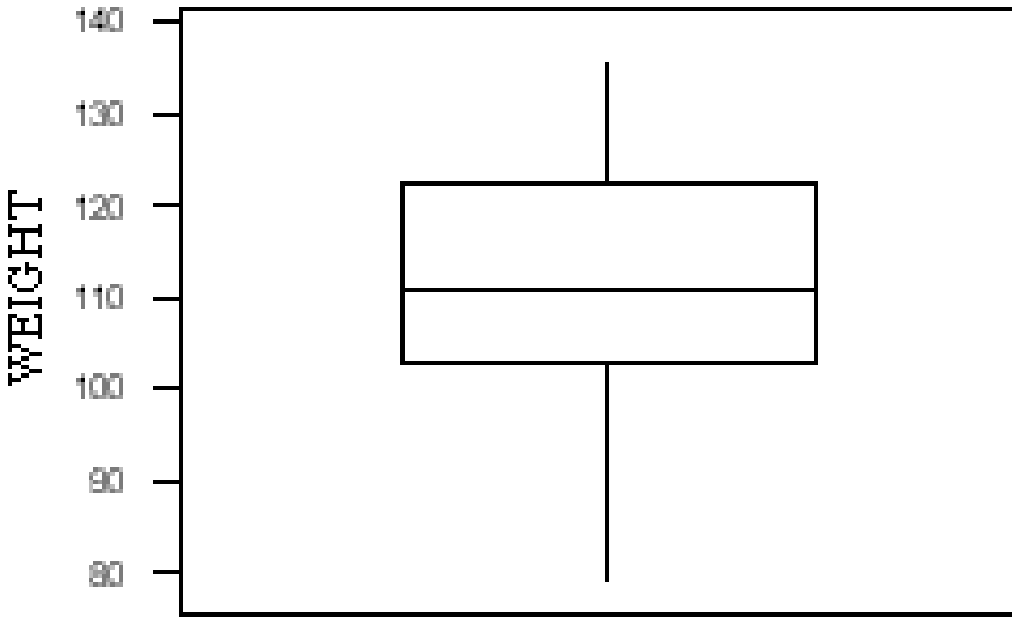
15. The boxplot is of the birthweight of a sample of 160 infants born in a local hospital. The number of children with birthweights between 103 and 123 ounces is approximately

A. 20
B. 40
C. 50
D. 80
E. 100



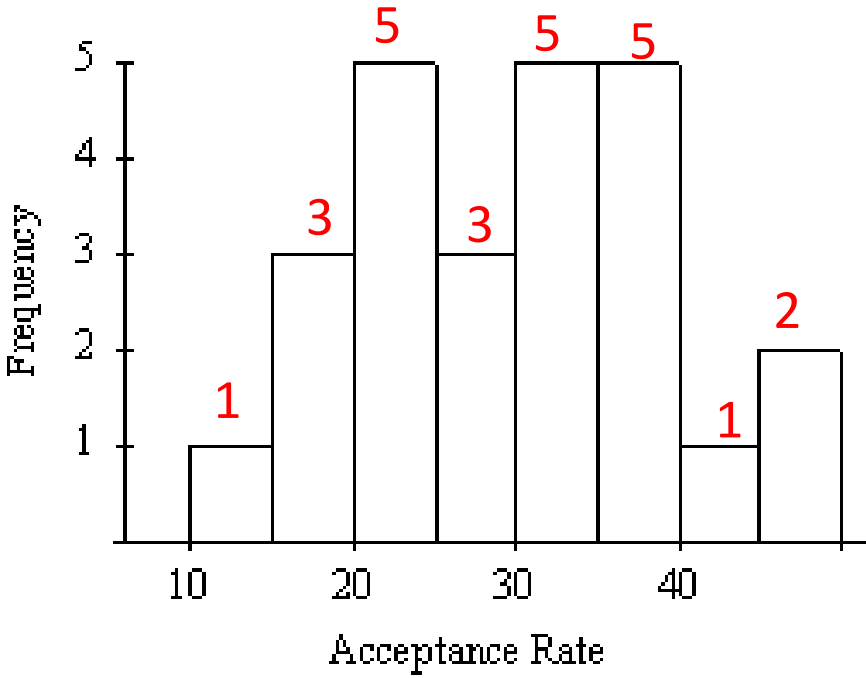
The following two histograms represents the distribution of acceptance rates among 25 business schools.

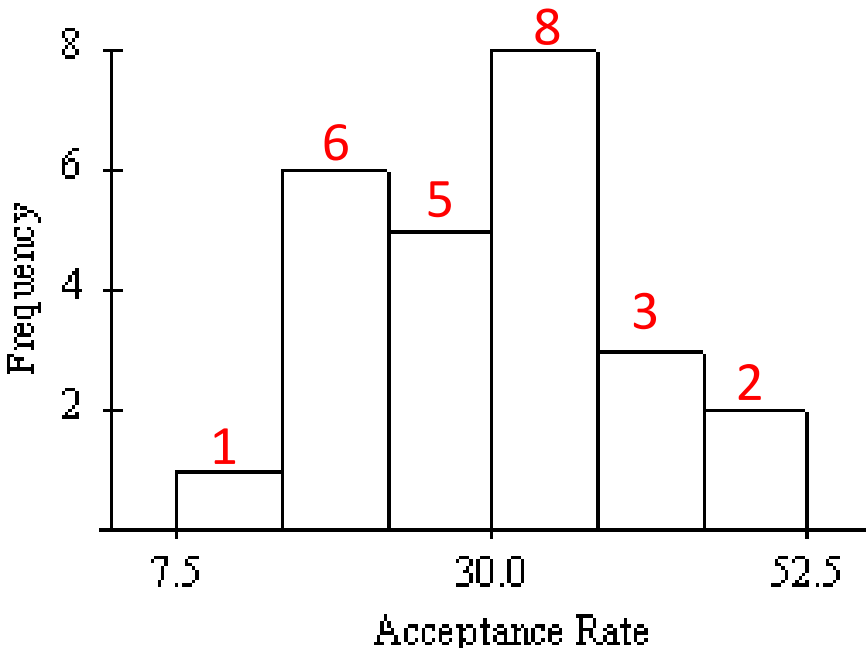
9. What percent of schools have an acceptance rate of less than 20%?

   A. 3% B. 4% C. 12%
   D. 16% E. 20%

10. Which interval contains fewer than half of all observations?

   A. 20%-35% B. 22.5%-37.5%
   C. 25%-40% D. 30%-45%
   E. 30%-52.5%





Other things

#16b → “Justify mathematically” for outliers = 1.5xIQR

#16d→ “compare” → SOCS

Pop Quiz

- Based on common mistakes from test.
- Pencils down after **four** minutes.

- Switch & grade your partner. Write # correct on top.
- Pass sideways

IQ

1. C
2. B
3. C
4. A
5. A
6. B
7. A
8. C
9. A
10. A

Awesomeness

1. B
2. A
3. A
4. C
5. C
6. B
7. A
8. A
9. C
10. A
11. B
12. B
13. A
14. C

Exit Pass (P.2)

Homework (reg)
Pg.122 #2.7(a), 2.8
Pg.131-132 #2.15, 2.19

These are your self-reported GPA's.

1. Sketch a density curve representing these data.
2. Draw a solid vertical line at the approximate location of the mean.
3. Draw a *dashed* vertical line at the approximate location of the median.

4.3
4.3
4
4
3.9
3.78
3.75
3.75
3.67
3.57
3.5
3.5
3.5
3.3
3.3
3.23
3.2
3.17
3
3
2.5