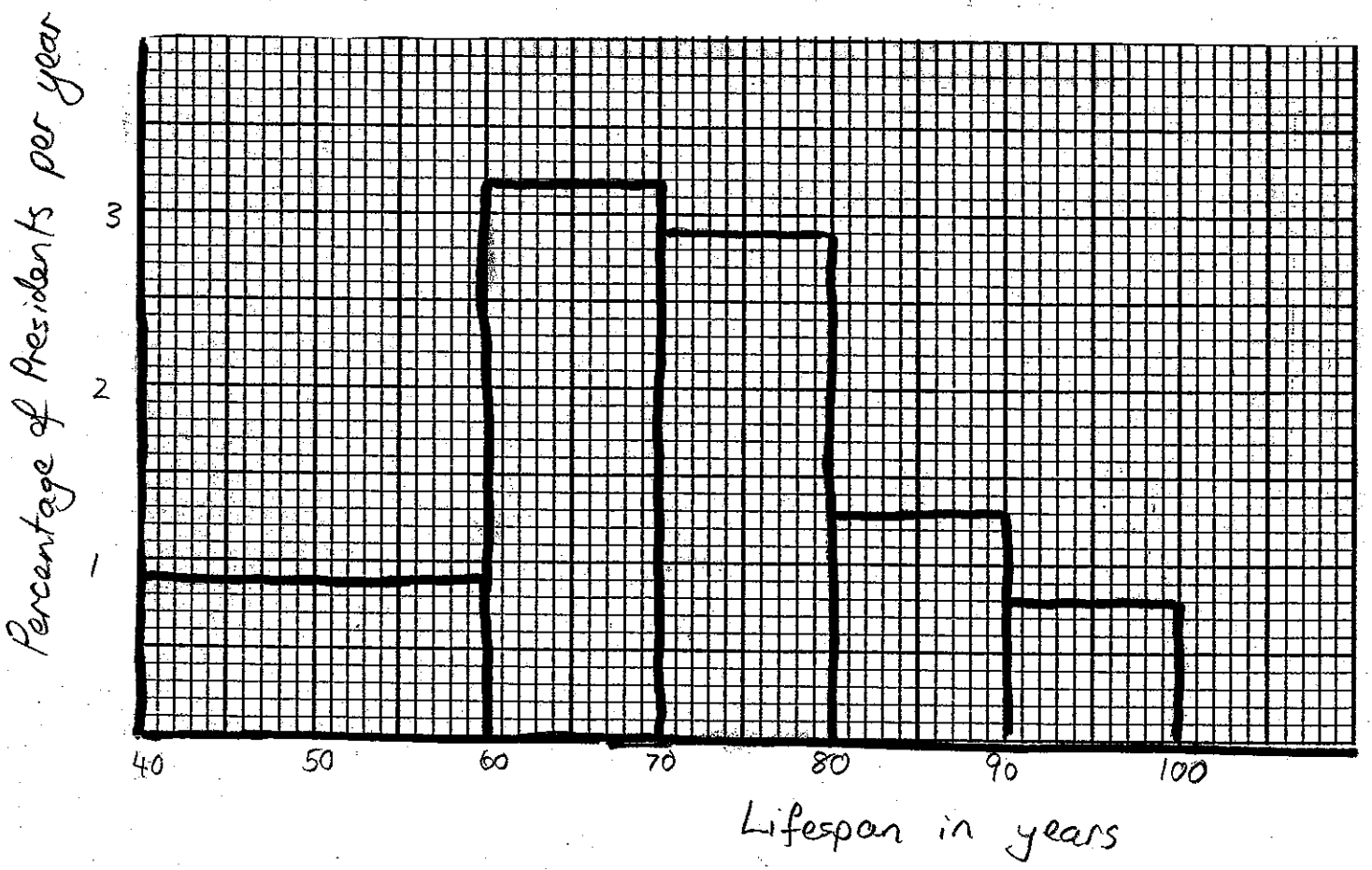
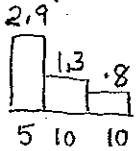
1. The following table gives the lifespans of the 38 US Presidents who are no longer alive. The class intervals include the left endpoint but not the right.

Width	Lifespan (years)	Number of Presidents	Percentage of Presidents	Height = %/width
20	40–60	7	$(7/38)\times 100\% = 18$	$18/20 = .9$
10	60–70	12	$(12/38)\times 100\% = 32$	$32/10 = 3.2$
10	70–80	11	$(11/38)\times 100\% = 29$	$29/10 = 2.9$
10	80–90	5	$(5/38)\times 100\% = 13$	$13/10 = 1.3$
10	90–100	3	$(3/38)\times 100\% = 8$	$8/10 = .8$
			100	

(a) (10 points) Draw the histogram. Be sure to LABEL BOTH OF THE AXES.



(b) (5 points) From you histogram, what percentage of the Presidents lived more than 75 years? (Please show your work)



$5(2.9) + 10(1.3) + 10(.8) = 35.5\%$

2. A class comprises 12 first grade students and 12 second grade students. All members of the class are given a reading test. The average for the first grade students is 45 with an SD of 15. The average for the second grade students is 75 with an SD of 15.

   (a) (5 points) The average score for *the class as a whole* would be

   i. Less than 45.

   ii. Somewhere between 45 and 75 but we don't know what.

   iii. 60. It should be exactly half way between because we have 12 of each.

   iv. Greater than 75.

   (b) (5 points) The SD of the scores for *the class as a whole* would be

   i. Less than 15.

   ii. 15.

   iii. Greater than 15. There will be more variability because the averages are so different.

3. (10 points) An administrator looked at a large group of USU students and had the freshmen and seniors take an IQ test. He found that the seniors scored higher on the test than the freshmen. Is he correct in concluding that as students progress through USU their IQ's increase? Explain clearly.

No, he is not correct. This is a cross-sectional study and if he wants to make conclusions about what happens as students progress through USU, he needs to do a longitudinal study (i.e. follow the same group of students as they progress). There could be confounding factors in the cross-sectional study, e.g. perhaps admission policies became less strict or perhaps the students with lower IQs dropped out between freshman & Senior year.

4. (2 points) Find the average and the SD of the following list of numbers: 22, 22, 13, 25, 8, 16, 18, 26, 12, 20, 14, 26, 14, 16, 12. ave = 17.6 SD = 5.46 (not 5.65)

5. (1 point) Find the median of the list of numbers in question 4.

   8, 12, 12, 13, 14, 14, 16, (16), 18, 20, 22, 22, 25, 26, 26 median = 16

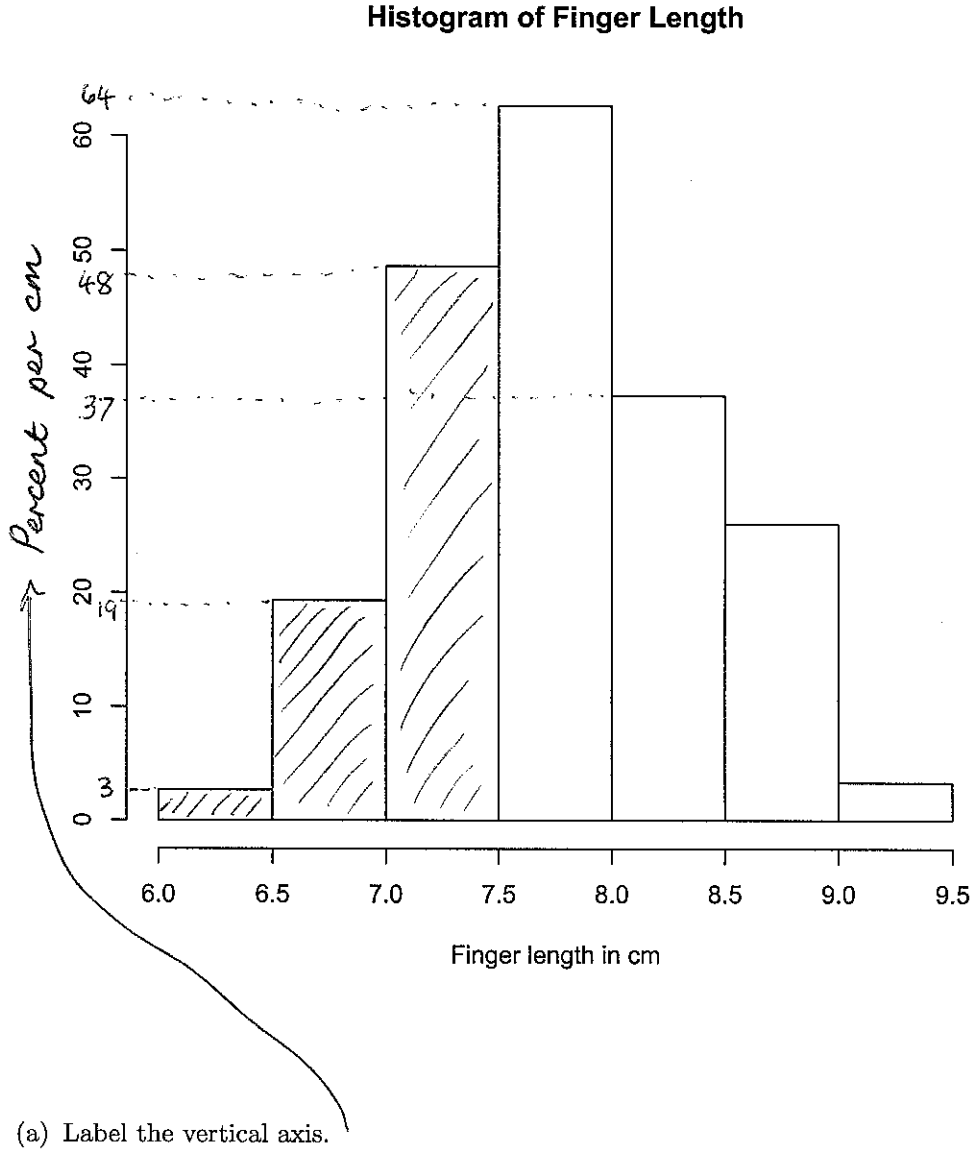
6. (2 points) A pediatrician has data on the heights of 25 2-year-old boys and 25 8-year-old boys. The heights of the 2-year-old boys have an average of 34.5 inches and an SD of 1.3 inches. The heights of the 8-year-old boys have an average of 50.5 inches and an SD of 1.3 inches. If we took all 50 boys, would the SD of the heights be (circle the correct one, no explanation is required):

   (a) less than 1.3 inches

   (b) equal to 1.3 inches

   (c) more than 1.3 inches The variability is greater

7. The following histogram summarizes the finger lengths of 300 men. Note that these are **NOT** the same as the students in questions 2 through 6. Class intervals include the left endpoint but not the right.



(a) Label the vertical axis.

(b) Using the histogram, what percentage of the men have fingers that are less than 7.5 cm long? Show your work.

Shaded area = $(.5)(3) + (.5)(19) + (.5)(48) = 35\%$

(c) Using the histogram, in which interval is the 80th percentile? Show your work.

35% below 7.5 (too low)

$(.5)(64) = 32\%$ between 7.5 and 8.0 gives $35 + 32 = 67\%$ less than 8.0

$(.5)(37) = 18.5\%$ between 8.0 and 8.5 gives $67 + 18.5 = 85.5\%$ less than 8.5 (too high)

So it's between 8.0 and 8.5.