2.1 Homework Worksheet

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1. (a) $\frac{6}{20} = .3 \rightarrow 30^{\text{th}}$ percentile
   (b) $\frac{18}{20} = .9 \rightarrow 90^{\text{th}}$ percentile
   (c) The boy with 22 pairs of shoes is more unusual. Unlike the girl, whose collection of shoes is greater than or equal to 30% of other girls, the boy has more than (or equal to) the amount of 90% of other boys

2. This means that 85% of vehicle speeds on those roads are less than or equal to the speed limit. The other 15% of speeds are greater than the speed limit.

3. (a) $\frac{320-450}{70} = -1.86$ standard deviations
   (b) $\frac{475-450}{70} = .36$ standard deviations
   (c) $\frac{610-450}{70} = 2.29$ standard deviations

4. $\frac{680-500}{100} = 1.8$ and $\frac{27-18}{6} = 1.5$ standard deviations. This means that, interpreting the z-scores, Eleanor performed better, as her value is more above than mean than Gerald.

5. $\frac{.42-.266}{.0371} = 4.15$, $\frac{.406-.267}{.0326} = 4.26$, and $\frac{.39-.261}{.0317} = 4.07$ standard deviations. According to the z-scores, Ted Williams performed the best, with Ty Cobb in second, and George Brett in third.

6. C

7. C

8. SKIP

9. (a) This would mean the student is 2.2 standard deviations above the average test score
   (b) This would mean the student is .4 standard deviations below the average test score
   (c) This would mean the student is 1.8 standard deviations below the average test score

(d) This student is exactly one standard deviation above the average test score

(e) This student received the average score on the test

10. (a) $z = \frac{60-40}{10} = 2$

    (b) $z = \frac{-30}{10} = -3$

    (c) $z = \frac{80-30}{10} = 5$

    (d) $z = \frac{20-50}{10} = -3$

11. (a) The difference is: $160 - 100 = 60$ IQ points

    (b) $z = \frac{160-100}{16} = 3.75$

    (c) Einstein's score is unusual, because it is 3.75 standard deviations from the mean, and $3.75 > 2$

12. The test with 18 points out of 15 is the highest relative score

    (a) $z = \frac{144-128}{34} = .471$

    (b) $z = \frac{90-86}{18} = .222$

    (c) $z = \frac{18-15}{5} = .6$