

8

Basic Types of Quantitative Comparisons

SOLUTIONS

1. Identify the type of quantitative comparison in the given statements.
 - a. Value
 - b. Absolute difference
 - c. Ratio (relative difference)
 - d. Percentage change
 - e. Absolute difference
 - f. Ratio (relative difference)
 - g. Rank (median is the 50th percentile)
 - h. Z-score (standardized value)
 - i. Value (in this case, the units of measurement are percentage points)
 - j. Rank
3. Identify the correct statements; rewrite the incorrect statements to correct them.
 - a. “Brand X lasts longer than Brand T, with an average lifetime 40% higher than Brand T’s.”
 - b. Correct as written.
 - c. “The ratio of flour to butter in shortbread is 2:1; the recipe uses twice as much flour as butter.”
 - d. Correct as written.
 - e. “Nadia’s test score was higher than 84% of students nationwide ($Z = 1.0$).” (Sixty-six percent are within 1 standard deviation of the mean [e.g., ± 1 standard deviation], but you must also include those for which $z < -1.0$ to answer this question correctly.)
 - f. “A panel of 200 consumers rated ISP A four to one over ISP B. In other words, four times as many panelists preferred Company A as their Internet service provider.”
 - g. Correct as written.
 - h. Correct as written.
 - i. “The value of mutual fund ABCD tripled since last year, going from 33 to 100.”
5. Fill in the missing information.
 - a. “Asians make about twice as much income as blacks.”
 - b. “Hispanics earn \$2,825 more than blacks.”
 - c. “Whites rank second in terms of median income, below only Asians and Pacific Islanders.”
 - d. “Asians earn 20% more than whites.”

7. With a comparison value of \$200:
- The two phrases “25% of the original price” (item a) and “marked down 75%” (f) have the same meaning. Each of those phrases corresponds to a price of \$50, equivalent to a ratio of 0.25.
- The phrases “costs 25% less than . . . ” (item b), “priced 25% off” (d), “75% of the original price” (g), and “costs 75% as much as . . . ” (h) are equivalent. They correspond to a price of \$150, equivalent to a ratio of 0.75.
- The two phrases “costs 25% more than . . . ” (item c) and “125% of the original price” (e) have the same meaning. They correspond to a price of \$250 and a ratio of 1.25.
9. Fill in the z-score for height for each boy in the sample.

**Table 8C. Heights of a sample of six-year-old boys
(standard population: mean = 115.12 cm; SD = 4.78 cm)**

| Name | Height (cm) | Z-score |
|-------|-------------|---------|
| David | 117.51 | 0.50 |
| Jamal | 113.90 | -0.26 |
| Ryan | 124.81 | 2.03 |
| Luis | 115.45 | 0.07 |
| JC | 112.73 | -0.50 |

SD = standard deviation

- a. Ryan is approximately two standard deviations above the average height for a six-year-old boy, while Luis is just about average and JC is half a standard deviation below average for his age.
- b. David and JC are half a standard deviation taller and shorter than the average six-year-old boy, respectively.
- c. Mike stands 119.90 cm tall.
11. Answer the questions about attributable risk from the information given.
- a. The attributable risk of hospital admission associated with diabetes is calculated: $[0.05(3.5 - 1)]/[0.05[3.5 - 1]] + 1] \times 100 = 11.1\%$. Prevalence is expressed as a proportion in the calculation.
- b. If diabetes could be eliminated, hospital admissions would decline by 11%.