SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Provide an appropriate response.

1) A digital scale reads 0.01 g when it is empty. Identify the potential error in the measurements made on this scale as random or systematic.

2) Totals are determined by rounding to tenths. Identify the potential error as random or systematic.

3) Select the measurement most likely to be subject to random error.
   1 - Measuring temperature with a digital thermometer
   2 - Measuring temperature with a mercury thermometer
   3 - Measuring a distance in yards by pacing
   4 - Determining the number of pennies in bags by dividing the weights of the filled bags by the legally defined weight of a penny

Answer the question.

4) The results of a poll are stated as follows: “Based on a survey of 156 randomly selected students, 90% of the student body of 2870 students agree that no student should have to take final exams in two consecutive exam periods.” If 2578 students actually agree, then what is the absolute error in the reported result?

5) The Democratic Party estimated that 3960 delegates were at the convention Monday afternoon, but 3600 were actually there. What is the relative error?

6) A 5.0 lb weight is measured to be 4.5 lb. What is the relative error?

Provide an appropriate response.

7) According to a specification, the nominal length of a particular manufactured part is 5.4523 cm. Quality control randomly selects four of the parts, and the lengths are measured by four different quality control technicians. The measurements are 5.3234 cm, 5.11259 cm, 5.351 cm, and 5.45 cm. Which measurement is the most precise?

8) The value of e, the base of the natural logarithm, is approximately 2.718282. Which of the following representations of this value is the most accurate?

9) Select the most believable statistical conclusion.

10) Analysis of income data based on a survey of 33 professors at a large midwestern university produced the report: “Average income (all sources) of professors is $64,245.21.” An astute reader would conclude that

Perform the requested conversion.

11) Convert \( \frac{7}{4} \) to decimal form.

12) Convert 0.32 to a percent.

13) Convert 5.43 to a percent.
Solve the problem.

14) A study was conducted of pleas made by 1689 criminals. Among those criminals, 914 pled guilty and 424 of them were sentenced to prison. Among 84 criminals who pled not guilty, 60 of them were sent to prison.

(i) What percentage of the criminals pled guilty?
(ii) What percentage of the criminals were sent to prison?
(iii) Among those who pled guilty, what is the percentage who were sent to prison?
(iv) Among those who pled not guilty, what is the percentage who were sent to prison?

Round your answers to the nearest percent.

Perform the requested conversion.

15) Convert 0.167% to decimal form.

Solve the problem.

16) Boys spend an average of $6800 on back-to-school clothes. Girls spend an average of $22,800. How much less is the boy’s average expenditure, relatively, than the girl’s expenditure (round to the nearest percent)?

Fill in the blank. Explain your reasoning.

17) If the area of State A is 7% less than the area of State B, then State A’s area is ___ % of State B’s area.

18) Doctor Murphy’s salary is currently 8% more than Doctor Carell’s salary, so Professor Murphy’s salary is ___ % of Professor Carell’s salary.

Solve the problem.

19) In a survey of 1334 consumers over the age of 13, 77% reported having at least one personal computer in their household. Find the actual number of respondents corresponding to the given percentage.
1) Systematic
2) Random
3) Measuring temperature with a mercury thermometer
4) 5 students
5) - 10%
6) - 10%
7) 5.11259
8) 2.71828
9) About 40% of the voters in Normal, Illinois are Democrat.
10) the precision is unjustified.
11) 1.75
12) - 32%
13) 543%
14) (i) 54%; (ii) 29%; (iii) 46%; (iv) 71%
15) 0.00167
16) 70%
17) 93%; State A has 100% of the area of State B minus 7% of the area of State B.
18) 108%; Doctor Murphy's salary is 100% of Professor Carell's salary plus another 8%.
19) 1027 respondents