SCH3UI

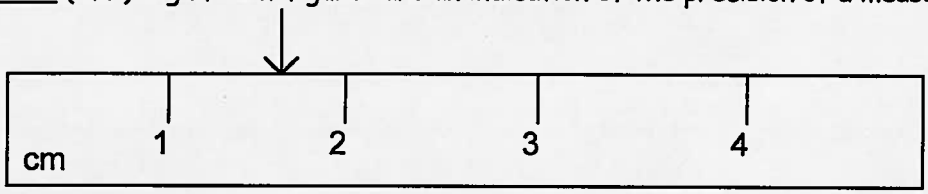
Name: Answers

Worksheet: Observations and Measurements

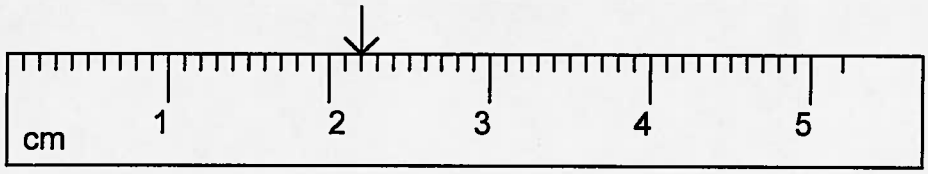
Part A: Multiple Choice and True or False

1. T (T/F) Significant figures include all the digits that can be known precisely and the last digit, which must be estimated.

2. T (T/F) Significant figures are an indication of the precision of a measurement.



3. a The best measurement, using significant figures, at the arrow above would be:
   a. 1.6 cm b. 1.60 cm c. 1.600 cm d. 1.6000 cm



4. c The best measurement, using significant figures, at the arrow above would be:
   a. 2.0 cm b. 2.2 cm c. 2.20 cm 2.200 cm

5. F (T/F) The ruler drawn in number 3 has a greater degree of precision than the ruler in number 4 and therefore the measurements has a greater number of significant figures.

6. b If a ruler was used to measure an object and the measurement obtained was 5.237 cm, what were the smallest divisions marked on the ruler?
   a. 0.1 cm b. 0.01 cm c. 0.001 cm d. 0.0001 cm.

7. F (T/F) All zeros recorded in a measurement are significant.

8. T (T/F) All zeros appearing between nonzero digits are significant.

9. T (T/F) Zeros to the right of nonzero digits and a decimal point are significant.

10. T (T/F) Writing measurements in standard exponential for is a way to avoid confusion as to which zeros are significant.

11. T (T/F) Observations are made using your senses.

12. F (T/F) Qualitative observations involve numbers.

13. F (T/F) An object that is ductile, can be hammered into a sheet

Part B: Significant Figures

Determine the number of significant figures in each of the following numbers.

14. 5 123.00
15. 2 3.2×10^{-6}
16. 3 0.005 06
17. 3 502 000
18. 4 0.070 80
19. 1 3 000 000
20. 4 3.400
21. 6 510.005
22. 3 2.10×10^{5}
23. 4 0.000 230 2

Part C: Rounding

Round off the following numbers to the number of significant figures indicated in parentheses.

24. 2.3355 (4) 2.336
25. 3.999 (2) 4.0
26. 4.401 (2) 4.4
27. 555 005 (3) 5.55×10^{5}
28. 8775 (3) 8780 or 8.78×10^{3}
29. 314.005 (4) 314.0

Part D: Calculations

Determine the sum, difference, product or quotient with the correct number of significant figures.

30. 2.225 + 5.55 = 7.78
31. 3.1000 - 1.99 = 1.11
32. 5.555 + 4.445 = 10.000
33. 3.3339 - 1.000 = 2.334
34. 2.22 + 8.8 = 11.0
35. 25.00/5.0 = 5.0
36. 4.00 x 2.0 = 8.0
37. 2.55 x 3.368 = 8.59
38. 30.0/6.000 = 5.00
39. 25.56 x 2.0 = 51 or 5.1×10^{1}
40. 500.0/1.0 = 5.0×10^{2}
41. 44.5 x 2.000 = 89.0

Part E: Converting

42. 3.45 cm = 0.000345 hm
43. 8.7 ML = 8 700 000 L
44. 9.86 s = 9860 ms
44. 256.47 dag = 2.5647 kg

Part F: Scientific Notation

Convert the following form scientific to standard notation or vice versa

46. 3.56×10^{9} = 3 560 000 000
47. 498 086 554 = 4.98086554×10^{8}
48. 0.000 034 = 3.4×10^{-5}
49. 8.8×10^{-6} = 0.000 008 8
50. 12 400 000 000 000 000 = 1.24×10^{16}