

Name: _____

Hour: _____

1. What are the two main causes of the uncertainty that exists in all measurements?

2. A digital watch can be read to the closest second. Will the readings on this watch be **precise**? _____

Will the readings on this watch be **accurate**? _____

Explain:

3. Four scientists visit the International Bureau of Standards and measure the "standard meter bar". Their measurements are 1.09 m, 1.09 m, 1.08 m, and 1.09 m. Are their measurements **accurate, precise, both, or neither**?

_____ Explain:

4. A nurse reports the body temperature of her patient to be 98.0°F.

a) How many significant figures does this measurement have? _____

b) How many **uncertain** digits does it contain? _____

5. Determine the number of significant figures in each of the following measurements:

a) 5.0 cm _____

e) 7.0010×10^9 m _____

b) 2.50 g _____

f) 0.0080 kg _____

c) 1000 m _____

g) 30.0 sec _____

d) 3.05 cm _____

h) 4.050 g _____

6. Perform each of the following calculations and **round off each answer to the correct number of significant figures**.

a) $6.5 \times 2.100 =$ _____

b) $2.331 \times 5.15 =$ _____

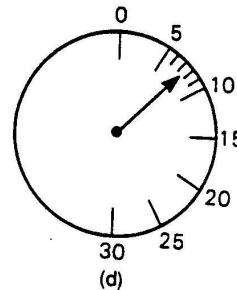
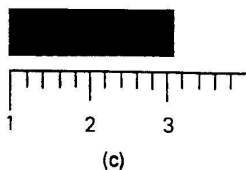
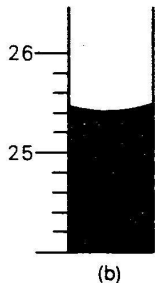
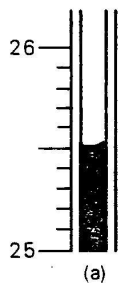
c) $6.2 \div 0.1620 =$ _____

d) $162.1 + 38.73 + 1.554 =$ _____

e) $21.9 + 6.34 + 157 =$ _____

f) $9.88 - 7.2 =$ _____

7. Read the four measurements to the correct number of significant figures that you think should be in the reading.



a) _____

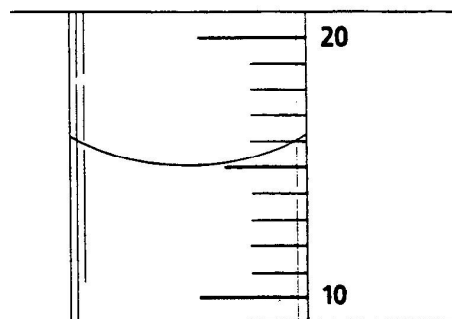
c) _____

b) _____

d) _____

8. A student reads the graduated cylinder that is illustrated to the right, and recorded the volume as 15.00 mL.

What is wrong with this measurement?



What should the correct reading be? _____

9. Using a new thermometer, a student measures the boiling point of pure water three times (at sea level). Each time the thermometer reads 98.6°C. A chemistry handbook states that the accepted value is 100.0°C.

a) What is the **absolute error**?

b) What is the **percent error**?

c) How would you describe the **accuracy** and **precision** of the new thermometer?