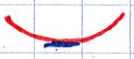
Measuring w/ Lab Equipment

- liquids & volumes & temperature
  - have a meniscus 
  - to a decimal point

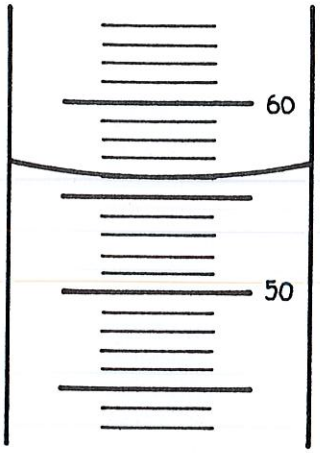
volume/temp. are read at the lowest point.

see next page for examples!

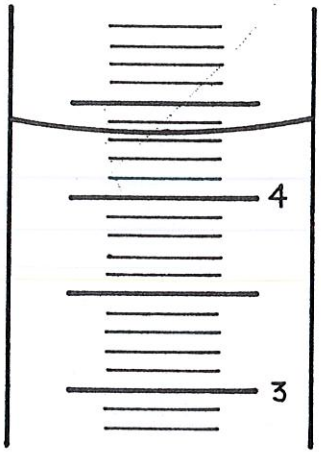
MEASURING LIQUID VOLUME

Name _____

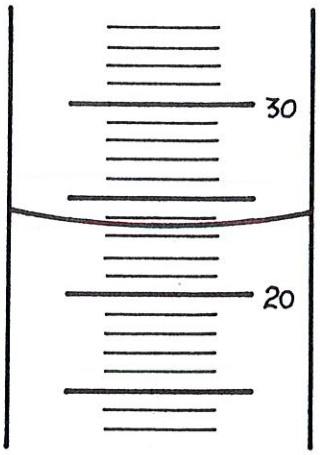
What volume is indicated on each of the graduated cylinders below? The unit of volume is mL.



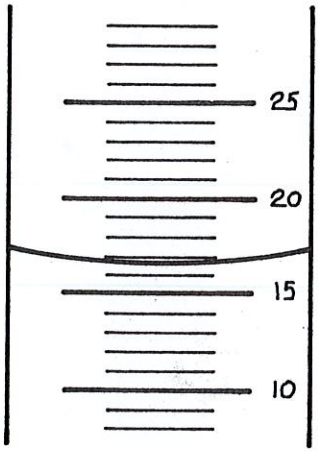
a) 56.0 mL



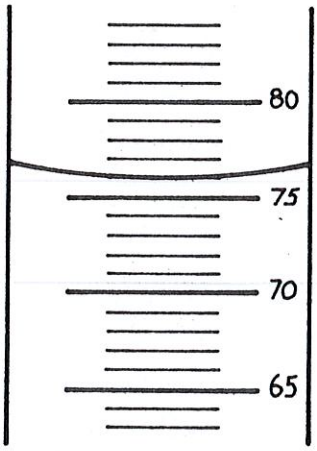
b) 4.33 mL



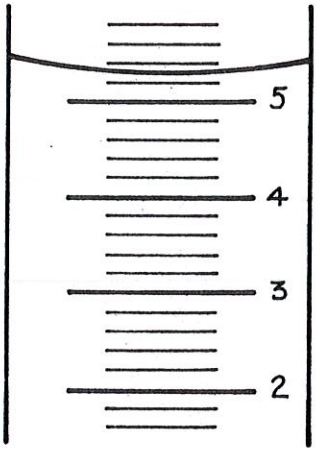
c) 23.6 mL



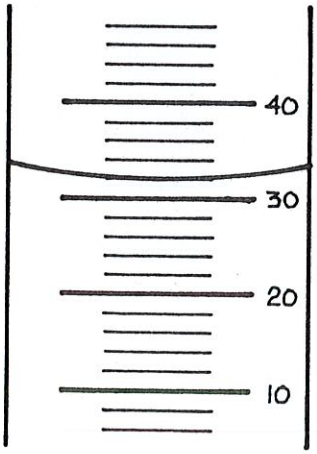
d) 16.8 mL



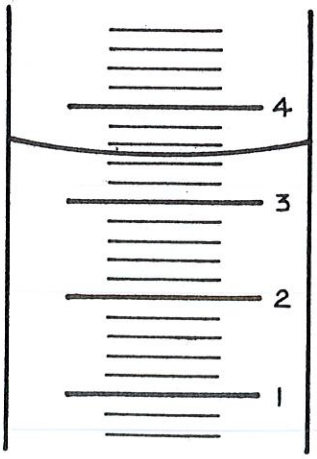
e) 76.0mL



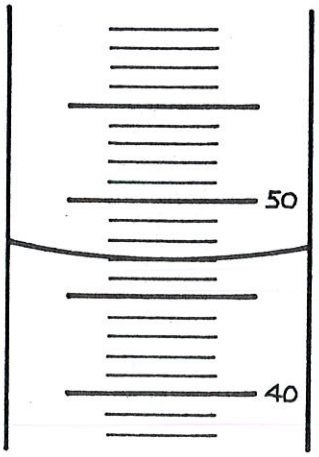
f) 5.25mL



g) 32.0mL



h) 3.5mL



i) 47.0mL

Significant Figures

the number of digits that carry meaning in a measurement

Rules

1. Any nonzero digits are significant

2. Zeroes between digits are significant (sandwiched zeroes)

3. Zeroes before digits are NEVER significant (leading zeroes)

4. Zeroes after digits are only significant if there is a decimal point explicitly written in the number (trailing zeroes)

Examples

3248 g — 4 s.f.

50 s — 1 s.f.

103 °C — 3 s.f.

920006 mm — 6 s.f.

0.0123 kg — 3 s.f.

0.001706 kg — 4 s.f.

0.98 s — 2 s.f.

520 mL — 2 s.f.

520. mL — 3 s.f.

.520 mL — 3 s.f.

520.00 mL — 5 s.f.

0.0005200 mL — 4 s.f.

30.6010 mL — 6 s.f.

0.900 L — 3 s.f.

0.00002019 0000 ms — 8 s.f.

Multiplying & Dividing

Your answer can have the same amount of significant as the measurement that has the LEAST AMOUNT of significant figures.

Ex) $20.0\ cm \times 12\ cm = 240\ cm^2$ (3sf × 2sf = 2sf)

$\frac{450.0\ g}{16.0\ mL} = 28.125\ g/mL = 28.1\ g/mL$ (4sf ÷ 3sf = 3sf)

$\frac{65.0\ m}{.87605\ s} = 74.19661827\ m/s = 74.2\ m/s$ (3sf ÷ 5sf = 3sf)

Adding & Subtracting

Your answer can have as many significant figures AFTER THE DECIMAL POINT as the measurement that has the LEAST AMOUNT of significant figures AFTER THE DECIMAL POINT.

Ex)

$$\begin{array}{rl} 32.66\ m & 2sf \\ +\ 4.5496\ m & 4sf \\ \hline 37.2096\ m & 2sf \end{array}$$

$37.21\ m$

$$\begin{array}{rl} 100.00\ °C & 2sf \\ -\ 75.0\ °C & 1sf \\ \hline 25.00\ °C & 1sf \end{array}$$

$25.0°C$

$$\begin{array}{rl} 100.00\ g & 2sf \\ -\ 18\ g & 0sf \\ \hline 82.00\ g & 0sf \end{array}$$

$82\ g$

$$\begin{array}{rl} 0.017693\ mL & 5sf \\ +\ 0.00042\ mL & 2sf \\ \hline 0.018113\ mL & 2sf \end{array}$$

$0.018\ mL$