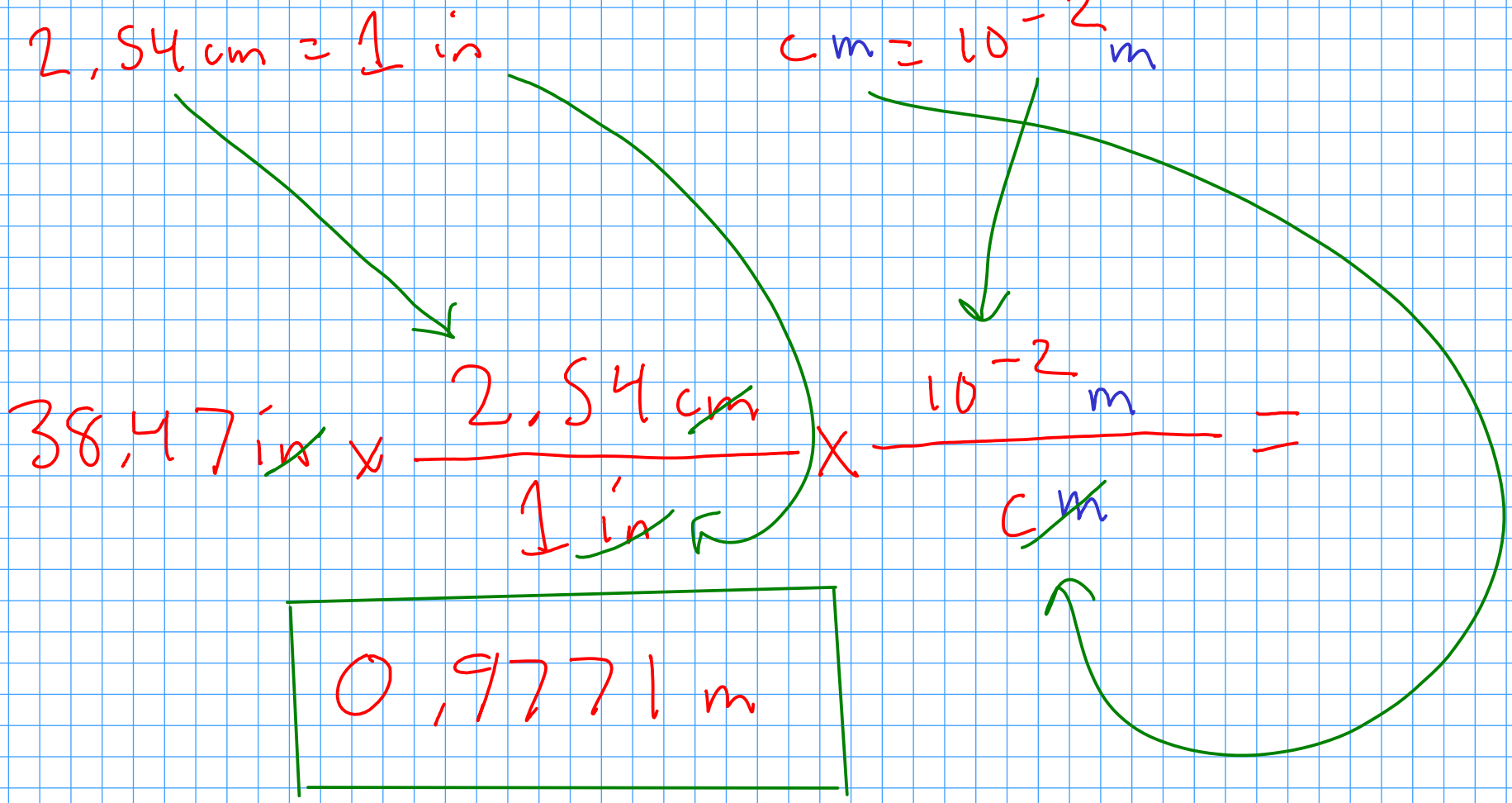
Convert 38.47 in to m, assuming 2.54 cm = 1 in



For nurses, one use of this method is for drug calculations.

Example: A patient is ordered 40 mg of codeine phosphate by subcutaneous injection. 50 mg in 1 mL liquid is available. How much of this liquid should be adminstered?

Start with the amount of codeine needed: 40 mg

50 mg in 1 mL is a conversion factor:

1 mL liquid = 50 mg codeine

$$40 \text{ mg codeine} \times \frac{1 \text{ mL liquid}}{50 \text{ mg codeine}} = \boxed{0.8 \text{ mL}}$$

A client is ordered 75 mg of amoxicillin orally.
125 milligrams in 5 mL of syrup is available.
How many mL will you administer?

5 ml syrup = 125 mg amox

$$75\text{ mg amox} \times \frac{5\text{ ml syrup}}{125\text{ mg amox}} = \boxed{3\text{ mL syrup}}$$

Accuracy and Precision

- two related concepts that you must understand wheh working with measured numbers!

Accuracy

- how close a measured number is to the CORRECT (or "true") value of what you are measuring

- "Is it right?"

- checked by comparing measurements against a STANDARD (a substance or object with known properties)

Precision

- how close a SET of measured numbers are to EACH OTHER

- "Can I reproduce this?"

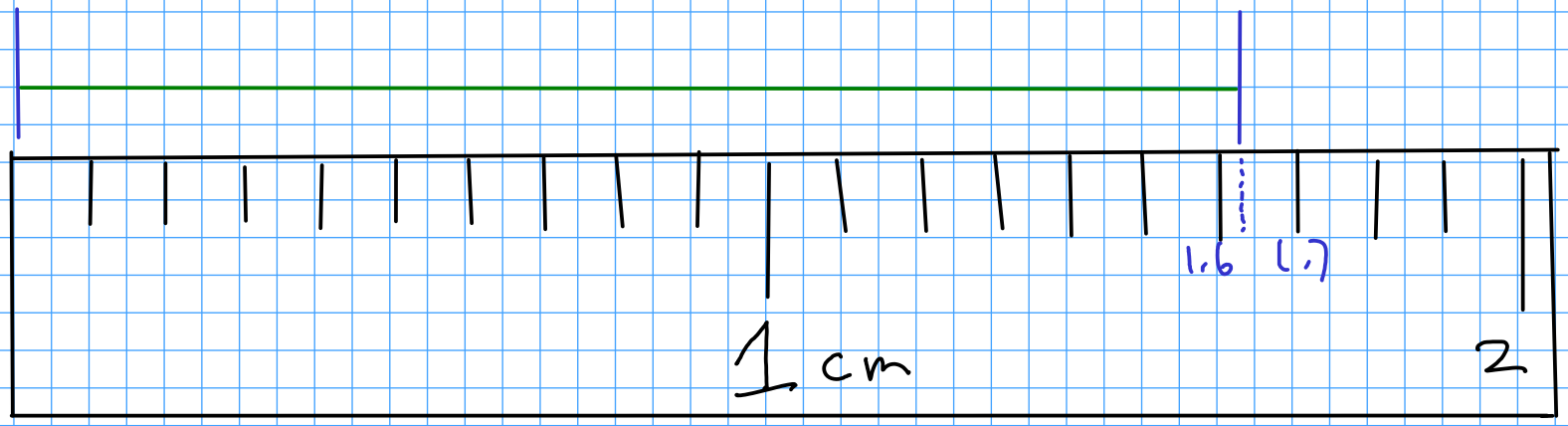
- checked by repeated measurements

More on precison

Every measurement contains some amount of ERROR, or some amount of deviation from the true value of what is being measured.

RANDOM ERROR is the variability in a measurement that cannot be traced back to a single cause. Random errors cause measurements to fluctuate around the true value, but can be averaged out given enough measurements.

When reporting measurements, we want to indicate how much random error we think is present. How?



How long is the green line?

Approximately, 1.62 cm ± .01

Our classroom experiment: Results

After throwing away obvious mistakes in reading the scale, we had:

Value	# students
1.60	1
1.61	2
1.62	11
1.63	3
1.65	2

Overall average

1.62

The first two digits did not vary; ithey are CERTAIN.

The last digit varied; it is UNCERTAIN.

When reading measurements from a scale, record all CERTAIN digits and one UNCERTAIN (or estimated) digit.