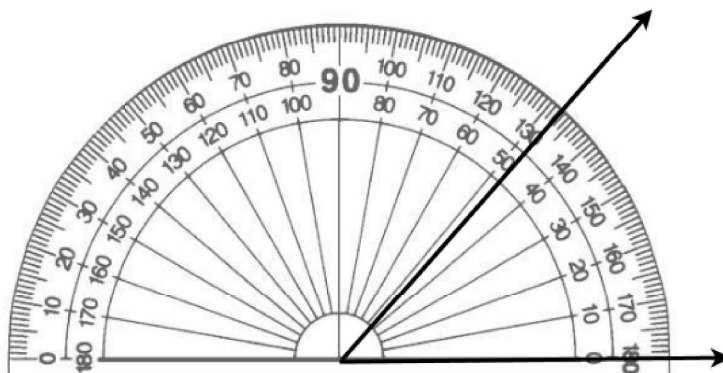


Accuracy and Precision

You could say that the angle shown measures 47° or 48° .

All of these measurements have accuracy, they just vary in their precision.

If you say that the angle is about 132° , that is not accurate - you are reading the protractor incorrectly!



Is each quantity below an exact value or a measurement?

- 1) Scott's height is 185 cm measurement
- 2) The gasket has 8 bolt holes along its edges exact value
- 3) The diameter of a bolt is $\frac{3}{4}$ inch measurement
- 4) There are 1000 g in 1 kg exact value

Accuracy - how close a measured value is to the true value

Example 1

When measuring out 1 cup of sugar for a cake, what assumptions do you make about the **accuracy** of your measurement?

- assume the measuring cup was manufactured properly
- assume you/the person measuring knows how to read the measuring cup correctly

notes - Accuracy & Precision.notebook

A measurement device may be **inaccurate** if:

- 1) Person does not read/use the measuring device correctly.
- 2) Measuring device is incorrect.

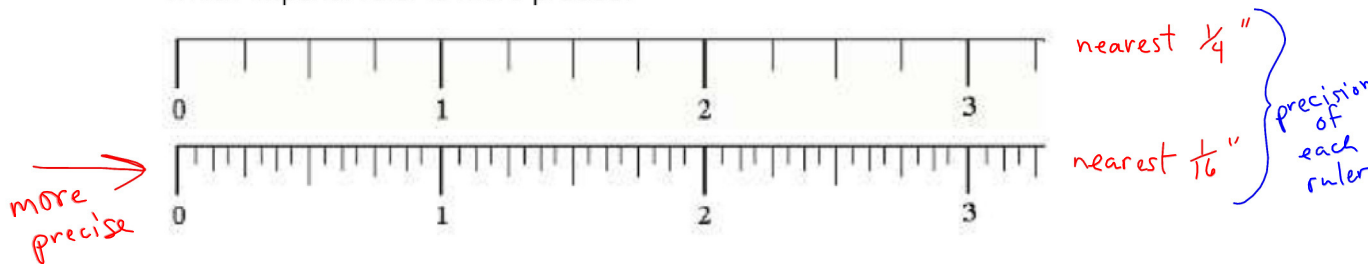
Degree of Accuracy

A *low degree* of accuracy means the value *is not* near the actual value.

A *high degree* of accuracy means the value *is very* near the actual value.

Precision - *the smallest unit of a measuring device*

Which imperial ruler is more precise?

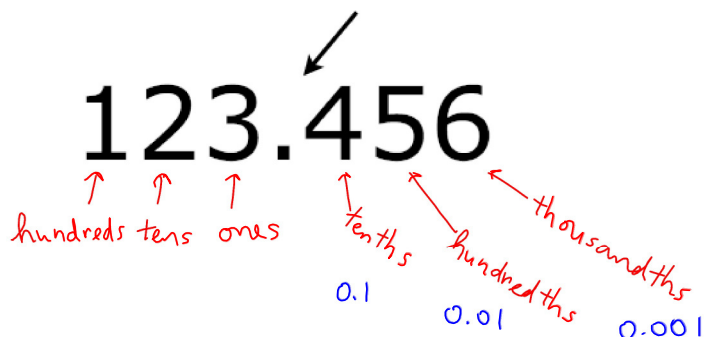


Example 2

How precise are each of the following?

- a) A one cup measuring device is precise to nearest cup
- b) A metre stick is precise to the nearest cm (or mm)
- c) A bathroom scale may be precise to 1 lb, 1/2 lb, 1/10 lb or 1 kg
- d) A ruler subdivided into $\frac{1}{8}$ th of an inch is precise to $\frac{1}{8}$ th inch

The precision of a number refers to the **place-value** of the last digit.



Example 2

- a) 3.45 cm is precise to 0.01 cm
- b) 867.2 kg is precise to 0.1 kg
- c) 15 km is precise to 1 km
- d) $3\frac{3}{4}$ inch is precise to 0.25 inch or $\frac{1}{4}$ inch

Degree of Precision

- A *low degree* of precision means there is a *large* uncertainty in a measurement.
- A *high degree* of ~~accuracy~~ *precision* means there is a *small* uncertainty in a measurement.