

LAB 2 - MEASURING TOOLS



ITEM LIST

- 1.) Ruler, caliper and micrometer
- 2.) Items to measure

2.1 Intro

An important part of manufacturing is **INSPECTION**. At manufacturing companies inspection usually falls under the QA (or Quality Assurance) or QC (quality control) department. Within QA, there is a special department called "metrology". They are responsible for the calibration of any measuring tools and equipment. Two common tools used to measure machined parts are the **CALIPER** and the **MICROMETER**. The caliper may read to a resolution of 0.0005 (half a thousandth of an inch) and an accuracy of 0.001" (one thousandth of an inch). A piece of paper is about 0.004" (4 thousandths) thick! A micrometer has a resolution of about 0.0001" and an accuracy of about 0.0001" (one ten-thousandths of an inch), making it more accurate than the caliper. These measuring tools are commonly used by machinists.

Non-digital calipers and micrometers require one to learn how to read the measurement. Micrometers will commonly also use a **VERNIER** as a way of obtaining an extra decimal place on the reading. Micrometers tend to either use a ratchet or a friction thimble to consistently control how much to "squeeze" part it is measuring. Some nicer calipers and micrometers have electronics and display the measurement digitally for easier reading.

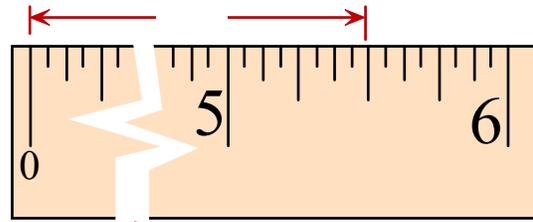
REFER to CT GUIDE on how to use a ruler, dial calipers, and micrometer. Also watch the posted videos.

2.2 Exercise

You will measure certain items with a ruler, caliper, and micrometer. The instructor will specify these items. Complete the values on the answer sheet.

The answer sheet also has some figures that require you to interpret the reading. Complete those as well.

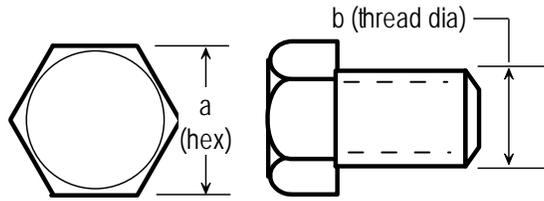
Note that some figures will show the measuring tool as a "broken" view. This means that the full length of the item (like a ruler) is not being shown. This allows the figure to be smaller and fit the form better.



Note - a "break" symbol indicates that the full length of this item is not being shown
The correct reading here is 5 1/2 inches

ANSWER SHEET

1. Measure a HEX HEAD SCREW with both the dial caliper and the micrometer and record values below



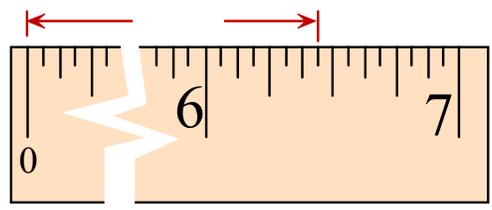
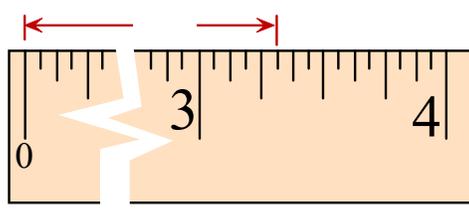
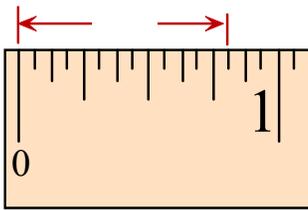
Caliper

Micrometer

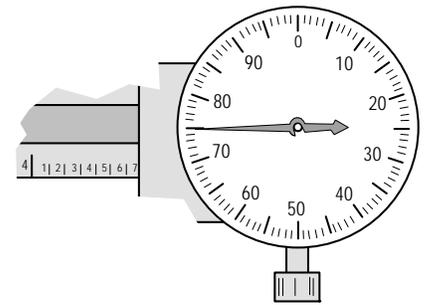
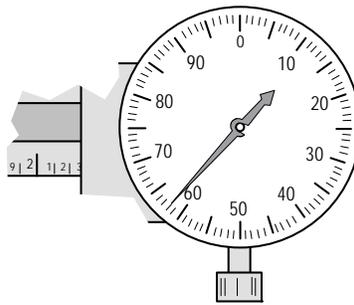
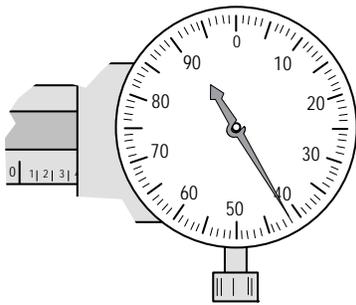
Hex head flats (dimension a) _____

Thread diameter (dimension b) _____

2. Record the reading indicated on the ruler



3. Record the reading indicated on the caliper



4. Record the reading indicated on the 1-inch micrometer

