# Knowledge Assessment

**Event: 1 of 2**

# Trainer & Assessor Marking Guide

## Criteria

### Unit code, name and release number

MEM12023A - Perform engineering measurements (1)

### Qualification/Course code, name and release number

MEM30205 - Certificate III in Engineering - Mechanical Trade (3)

Version: 1.0

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For queries, please contact:

IMRS SkillsPoint

Building B, Level 1

Hamilton Campus, 91 Parry St Newcastle West, NSW 2302

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This assessment can be found in the: [Learning Bank](https://share.tafensw.edu.au/share/access/searching.do?doc=%3Cxml%2F%3E&in=P7ac4831b-430a-4b8d-8b56-f7b32ed5b9cf&q=&type=standard&sort=rank&dr=AFTER)

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## Assessment instructions

Table 1 Assessment instructions

| Assessment details | Instructions |
| --- | --- |
| **Instructions for the trainer and assessor** | This is a written assessment and will be assessing the student on their knowledge of the unit.  This assessment is in 3 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions   Model answers, sample responses or a criteria for each question are provided below.  Use these to support your judgement when determining a satisfactory result.  The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct. However, if a student provides information other than indicated below, and in the professional opinion of the assessor it is appropriate and meets the intent of the question, it may be considered correct.  The assessment feedback page must be signed by both the student and the assessor so the student displays that they have received, understood and accepted the feedback.  Complete the assessment feedback to the student and ensure you have taken a copy of the assessment prior to it being returned to the student.  Ensure the students name appears on the bottom of each page of the submitted assessment. |
| **About this marking guide** | The student’s response to each question must contain the information indicated in this marking guide in order for their response to be correct.  All questions must be answered correctly in order to satisfactorily complete this assessment event.  Assessors will need to make a judgement call as to whether each answer/response meets the criteria based upon the:   * Rules of Evidence:   + Validity – does the answer address the assessment question and does the evidence reflect the four dimensions of competency?   + Sufficiency – is the answer sufficient in terms of length and depth?   + Currency – has the work been done so recently as to be current?   + Authenticity – is this work the student’s own authentic work? * Principles of Assessment:   + Fairness – individual student’s needs are considered in the assessment process   + Flexibility – assessment is flexible to the individual student   + Validity – any assessment decision is justified, based on the evidence of performance of the student   + Reliability – evidence presented for assessment is consistently interpreted and assessment results are comparable irrespective of the assessor conducting the assessment * Dimensions of competency   + Task skills   + Task Management Skills   + Contingency Planning Skills   + Job Role Environment Skills |
| **Student must provide** | Calculator, pens |
| **Assessor must provide** | Knowledge Assessment |
| **Due date/time allowed** | TBA / One hour |

## Part 1: Multiple choice

Read the question and answer each question carefully. Put an X in the table next to your chosen answer.

1. A micrometer is best protected from damage by:

Table 1 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Storing in a box immediately after use | X |
| 1. Storing on top of the machine immediately after use |  |
| 1. Leaving on the bench with other tools |  |
| 1. Hanging on a rack |  |

1. When you finish with a precision measuring instrument, the instrument must be:

Table 2 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Left on the workbench for the next person to use |  |
| 1. Placed in your toolbox |  |
| 1. Left where it is so it can be used later, if required |  |
| 1. Cleaned, placed in its storage box and stored in a clean dry place | X |

1. Steel rules are used to measure lengths. Approximately what degree of accuracy will they give you:

Table 3 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 0.025mm |  |
| 1. 0.25mm |  |
| 1. 0.5mm | X |
| 1. 0.05mm |  |

1. Name the two (2) measuring systems commonly used in Australia

Table 4 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Metric and Imperial | X |
| 1. Metric and BSW |  |
| 1. BSW and Imperial |  |
| 1. UNC and Metric |  |

1. Retracting the blade on a measuring tape when it is oily and dirty will:

Table 5 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Obliterate or damage the markings on the tape | X |
| 1. Lead to inaccurate readings |  |
| 1. Not affect the tape as they are made of corrosion resistant material |  |
| 1. Help to lubricate the tape measure |  |

1. A nonverbal method of communicating technical information that can be used at all levels of engineering to manufacture parts is by

Table 6 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. SMS |  |
| 1. Phone call |  |
| 1. Freehand sketch | X |
| 1. Email |  |

1. Which would be best to measure a length of 95.5mm to within 0.5mm?

Table 7 multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 150mm rule | X |
| 1. Micrometer |  |
| 1. Tape measure |  |
| 1. Protractor |  |

1. Which would be best to measure a diameter to within 0.01mm?

Table 8 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 150mm rule |  |
| 1. Micrometer | X |
| 1. Vernier |  |
| 1. Protractor |  |

## Part 2: True or false

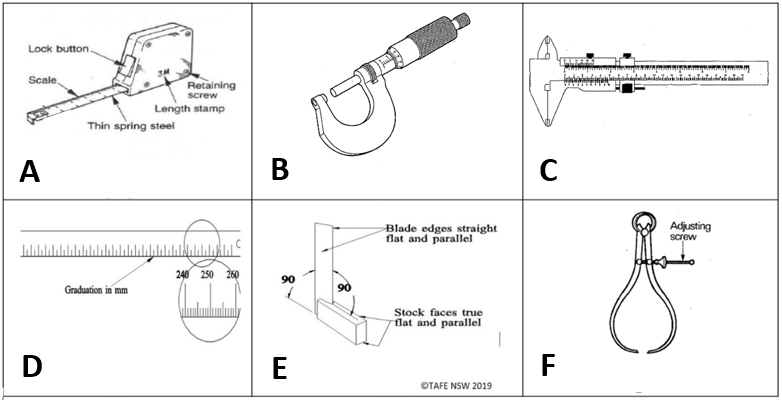
Read the question and then write **True** or **False** in the space provided.

| Question | Write *True* or *False* |
| --- | --- |
| 1. A pressure gauge which gives a negative pressure is known as a vacuum gauge | True |
| 2. Dirty measuring instruments won’t affect the accuracy of measurements taken | False |
| 3. The hook end of an 8m tape measure should not move | False |
| 4. Measuring tools are designed to withstand exposure to wet weather | False |
| 5. When welding it is ok to leave measuring tools near the heat source | False |
| 6. You should always use the measuring tool for the job it is designed for | True |
| 7. When not in use, measuring tools should be stored in a dry location where other tools will not damage them | True |
| 8. Freehand sketching can be used to provide a means of producing a simple pictorial representation of a component. | True |
| 9. Freehand sketching is a way of communicating information from the field to the factory | True |
| 10. Store instruments in its own case or in a box to protect it from damage | True |
| 11. Lightly oil or wrap the instrument in oiled paper | False |
| 12. Always avoid touching measuring surfaces with your bare fingers as they can leave an oily film (fingerprints) which attract dirt and can cause corrosion of some metals. | True |

## Part 3: Short answer

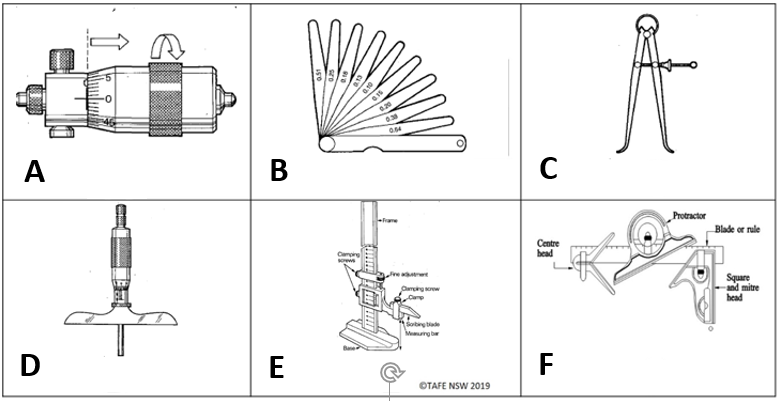
Read the question carefully. Your answer should be a minimum of 1 word but no longer than 30 words.

1. In the table below, name the tool shown with the corresponding letter. e.g. A = Tape measure



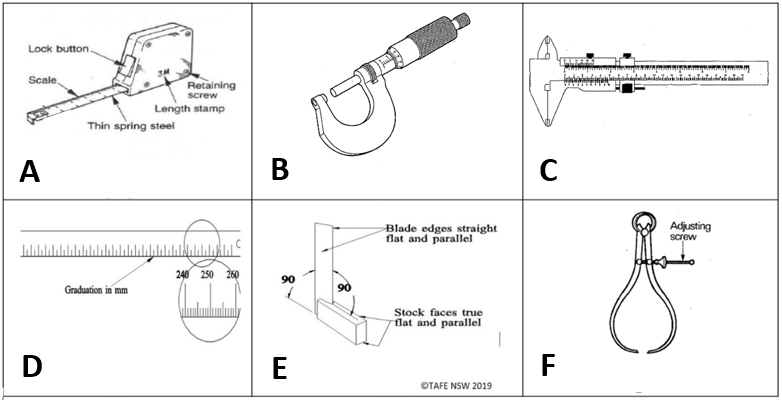
|  |  |
| --- | --- |
| Picture | Name |
| **A** | **Tape measure** |
| **B** | Outside micrometer |
| **C** | Vernier calipers |
| **D** | Steel rule |
| **E** | Engineers square |
| **F** | Outside calipers |

1. Using In the table below, name the tool sown with the corresponding letter.
2. In the table below, name the tool shown with the corresponding letter.



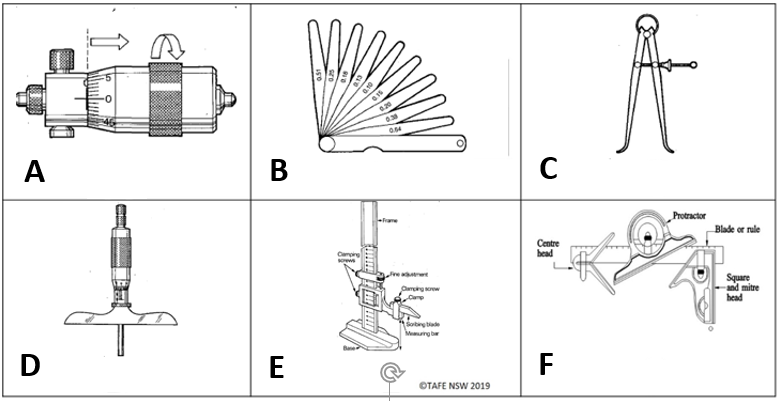
|  |  |
| --- | --- |
| Picture | Name |
| **A** | Inside micrometer |
| **B** | Feeler gauges |
| **C** | Inside calipers |
| **D** | Depth micrometer |
| **E** | Vernier height gauge |
| **F** | Combination set |

1. Using the sketches of measuring tools, complete the table below by indicating the correct name next to their most suited application e.g. picture **A** – Measurements over a long distance



|  |  |
| --- | --- |
| Picture of Measurement tool | Part letter selection from pictures |
| Accurate measurements, to within 0.5mm, over the length of the device | *D* |
| Measuring outside diameters to 0.01mm | *B* |
| **Taking measurements over long distances** | **A** |
| Checking surfaces are at 90 degrees to each other | *E* |
| Accurately make external, internal and depth measurements to 0.02mm | *C* |
| Accurate transfer of outside measurements | *F* |

1. Using the sketches of measuring tools, complete the table below by indicating the correct name next to their most suited application

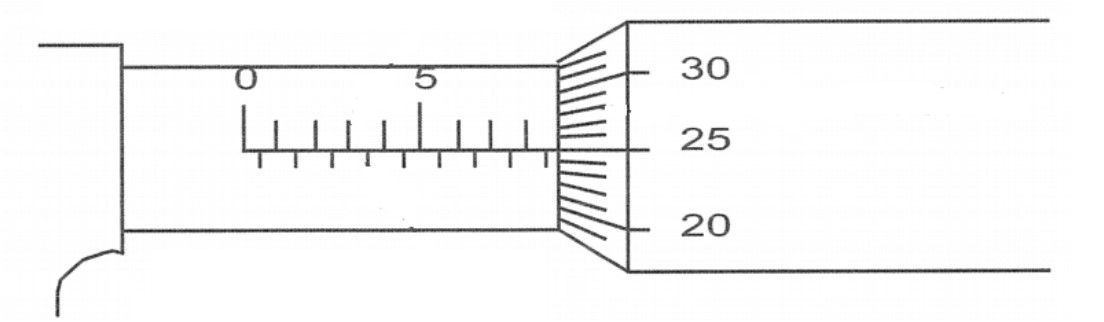


|  |  |
| --- | --- |
| Picture of Measurement tool | Part letter selection from pictures |
| Marking lines at any angle and to locate the centre of circular objects | *F* |
| Accurate transfer of inside measurements | *C* |
| Measuring steps and depths to 0.01mm | *D* |
| Accurate Vernier measurement of heights | *E* |
| Measuring inside diameters to 0.01mm | *A* |
| Checking small gaps and clearances between components | *B* |

1. Complete the table below by writing the correct answer next to the questions

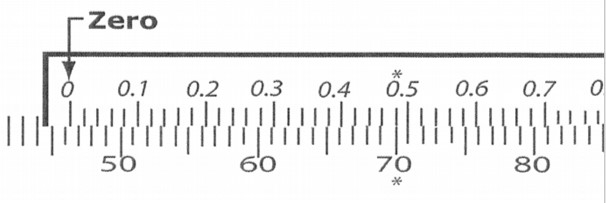
|  |  |
| --- | --- |
| Question | Answer |
| 1. The measurement of length through the centre of a circle from one side of a circle to the other side is known as the | Diameter |
| 1. A measurement taken in a straight line is known as | Length |
| 1. How many millimetres (mm) are there in 1 meter? | 1000mm |
| 1. How many meters are there in 1 Kilometre? | 1000m |
| 1. How many millimetres (mm) are there in one inch (1”)? | 25.4mm |

1. The reading on the Micrometre scale as shown in the diagram below is



Answer: 8.75mm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The reading on the Vernier calliper scale, as indicated by the asterisks, in the diagram below is



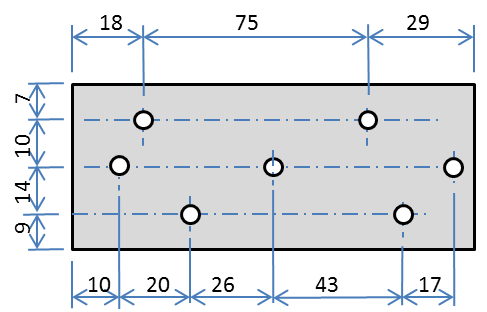
Answer: 46.48mm\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Complete the table below by writing the correct answer next to the questions.

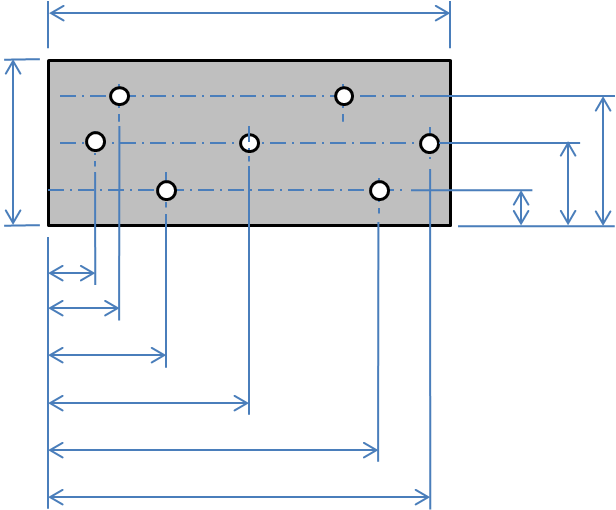
|  |  |
| --- | --- |
| Question | Answer |
| 1. How many millimetres (mm) are there in 10” inches | 254mm |
| 1. Convert 3 ¼ “ inches to millimetres (mm) | 82.55mm |
| 1. Convert 19.75mm to inches ( round off to 2 decimal points) | 0.78” |
| 1. 1,239 + 4,367 + 5,874 = | 11480 |
| 1. 8,329 – 4,367 = | 3692 |
| 1. 127 x 96 = | 12192 |
| 1. 11,176 ÷ 88 = | 127 |
| 1. Convert 5/8 to a decimal ( round off to 3 decimal places) | 0.625 |

1. Drawing A and Drawing B below are showing the same joining plate. Use the dimensions given in Drawing A, calculate and record the dimensions for Drawing B in the space provided.

|  |  |
| --- | --- |
| Dimension | Record missing dimension |
| **A** | 40 |
| **B** | 122 |
| **C** | 9 |
| **D** | 23 |
| **E** | 33 |
| **F** | 10 |
| **G** | 18 |
| **H** | 30 |
| **J** | 56 |
| **K** | 99 |
| **L** | 116 |

 ***Drawing A***

**L**

***Drawing B***

**B**

**E**

**G**

**F**

**A**

**D**

**H**

**J**

**K**

**C**

**G**

1. Using the drawing of the joining plate in question 9, calculate the length required to mark out 40 off joining plates from a 6 metre length of flat bar

Answer: 40 x 122 = 4880mm

1. Using the answer from question 10 what would be the length of offcut left from the 6 metre length of flat bar

Answer: 6000 – 4880 = 1120mm

1. In the table below number in the correct order the zero adjusting procedures for the use of a digital calipers.

|  |  |
| --- | --- |
| Zero Adjustment Description | Order of step (No) |
| Wipe faces and slide faces with a clean cloth | 2 |
| Slide open caliper jaws | 1 |
| Slide jaws to open/close and check reading | 5 |
| Press reset button to calibrate a zero reading | 4 |
| Slide closed the caliper jaws with slight pressure | 3 |

1. A micrometer must always be checked for accuracy prior to its use. In the table below, number the correct sequence in order for a zero adjustment of a 0mm - 25mm outside micrometer.

|  |  |
| --- | --- |
| Zero Adjustment Description | Order of step (No) |
| Close micrometer using ratchet stop | 1 |
| open measuring face by winding spindle out one revolution | 4 |
| Using ratchet stop close measuring faces for final check adjustment | 5 |
| Insert large end of spanner in hole on external cylinder. | 2 |
| Use wrench to rotate cylinder until Zero graduations are aligned | 3 |

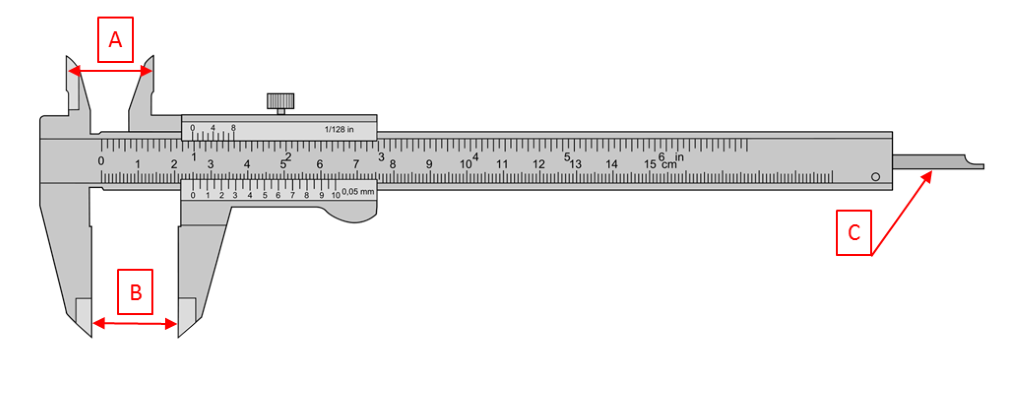
1. List 4 **safe** practices you must follow when using measuring tools.

|  |
| --- |
| 1. **Wear appropriate PPE in the workplace** |
| 1. **Deburr all work before measuring** |
| 1. **Make sure work is stationary before taking any measurments** |
| 1. **Be aware of all sharp instruments** |
| 1. **Don’t skylark in the workplace** |
| 1. **Don’t throw measuring instruments onto work benches** |

1. Using the planning and sequencing job steps below, place a number from 1 to 5 in each box on the left to reflect the correct order measurement operations are carried out.

|  |  |
| --- | --- |
| Planning and sequencing | |
| *4* | Check measurements are taken twice for accuracy. |
| *5* | Store measuring devices in accordance with manufacturers' specifications or standard operating procedures. |
| *2* | Selecting the appropriate measuring device for the given measuring task. |
| *1* | Fill out TAFE risk identification tool, ensure correct PPE is worn for the environment and safe work practices and procedures are adhered to. |
| *3* | Take measurements with the selected device using the appropriate technique. |

1. The Vernier calliper shown below has three (3) parts labelled. In the space provided, give an example of an item that can be measured with each.

****

|  |  |
| --- | --- |
| **Part** | **Example of an item that measured** |
| A | Internal gaps/diameters of objects. E.g. diameter of a drilled hole |
| B | External widths or diameters of objects. E.g. Drill bit |
| C | Depths of recess or blind hole. E.g. Blind hole depth |