# 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

MEM30305 - Certificate III in Engineering - Fabrication Trade (4)

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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. The assessment is closed book  This assessment is in 4 parts:   1. Multiple choice questions 2. True or False questions 3. Short answer questions 4. Assessment feedback   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** | Writing equipment |
| **Assessor must provide** | Classroom suitable for conducting written assessment test. |
| **Time allowed** | 1 Hour |

## Part 1: Multiple choice

1. (RK1) Which of the following tools is most suited to measuring the diameter of a drill bit?

Table 1 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 300 mm rule |  |
| 1. 150 mm rule |  |
| 1. 150 mm outside callipers |  |
| 1. Vernier callipers | X |

1. (RK 1) Which of the following tools is most suited to measuring the outside diameter on a piece of 300 nominal bore (NB) pipe?

Table 2 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. 300 mm rule |  |
| 1. 8 metre tape measure | X |
| 1. 150 mm outside callipers |  |
| 1. Vernier callipers |  |

1. (RK 2) What is the smallest measurement gradient normally found on a 300 mm steel rule?

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. (RK 2) An 8 Metre tape measure has a hook end which is loose to…

Table 4 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Allow adjustments as the tape measure wears |  |
| 1. Enable measurements to be taken from the inside and outside of the hook | X |
| 1. Lessen the damage to the operators finger if the tape retracts too quickly |  |
| 1. Provide a point for lubrication to be applied |  |

1. (RK 4) Retracting the blade on a measuring tape when it is dirty can:

Table 5 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Obliterate or damage the markings on using the tape | X |
| 1. Lead to inaccurate readings |  |
| 1. Nothing as they are made of corrosion resistant material |  |
| 1. Shorten the life span of the measuring tape. |  |

1. (RK 6) From the list below select the most appropriate method of non-verbal communication to provide technical information for the manufacture of an item:

Table 6 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Face to face discussion |  |
| 1. Phone call |  |
| 1. Freehand sketch | X |
| 1. Twitter |  |

1. (RK 6) From the list below select three (3) common uses for sketches in engineering:

Table 9 Multiple choice

| Answer choices | Put X next to your answer |
| --- | --- |
| 1. Provides a means of presenting a component or part for fabrication | X |
| 1. Gives clear and concise information from field to factory | X |
| 1. A method of communication between tradespeople | X |
| 1. Provides a formal record for compliance with data assurance procedures |  |

## Part 2: True or false

*Copy and paste the exact questions as per the student assessment and add your model answers for each question. These answers will be the marking criteria used to determine competency.*

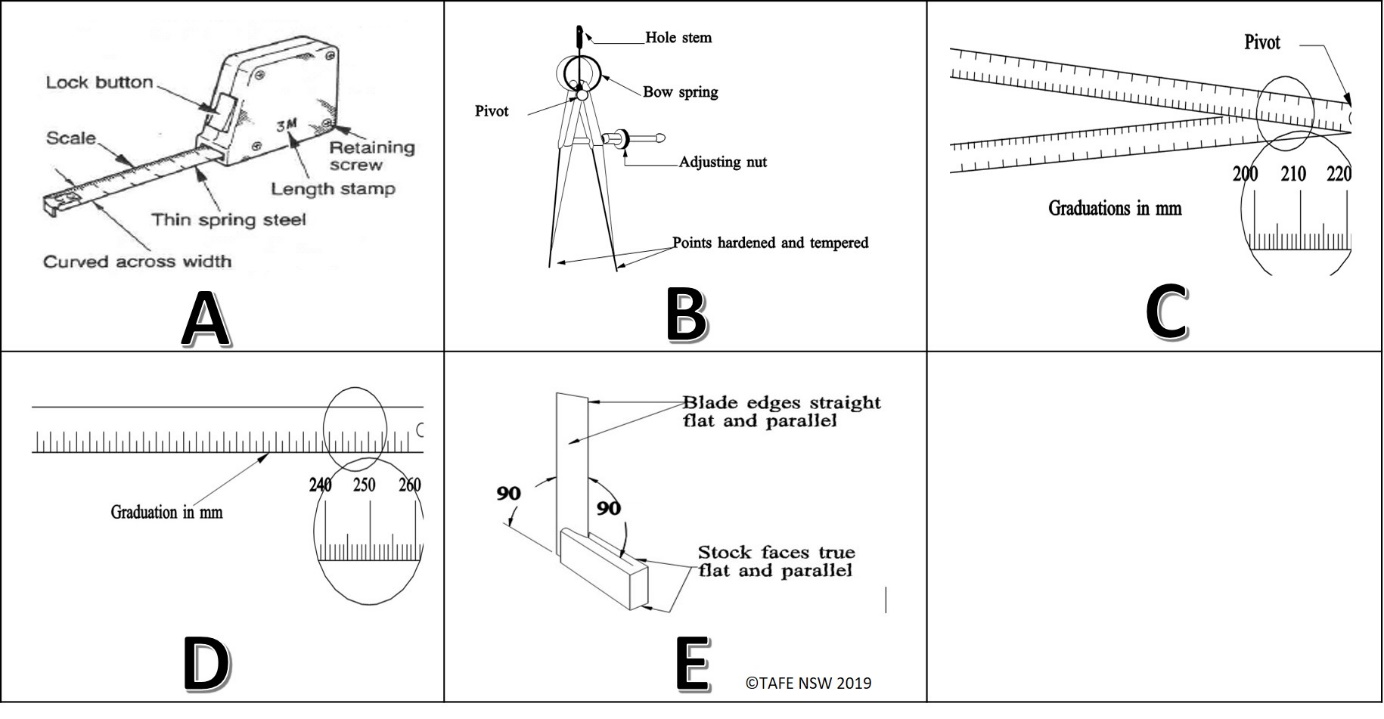
Table 1 True or false

| Question | Write *True* or *False* |
| --- | --- |
| 1.(Rk 1) A pressure gauge which gives a negative pressure is known as a vacuum gauge | *True* |
| 2. (Rk 2) Accumulative error is when the final measurement is too long or short | *True* |
| 3. (Rk 2) Geometric development requires the operator to use a calculator to determine bisection points and angles of 900 , 600 , 450 , 300 , 150 | *False* |
| 4. (Rk 2) Kilograms is really a measure of mass not weight | *True* |
| 5. (Rk 2) Newton is a measure of mass | *False* |
| 6. (Rk 2) The hook end of an 8m tape measure should not move | *False* |
| 7. (Rk 4) Measuring tools are designed to withstand exposure to wet weather | *False* |
| 8. (Rk 4) When welding it is ok to leave measuring tools near the heat source | *False* |
| 9. (Rk 4) Measuring tools should only be used on tasks for which they were designed | *True* |
| 10. (Rk 4) When not in use, measuring tools should be stored in a dry location where other tools will not damage them | *True* |

## Part 3: Short answer

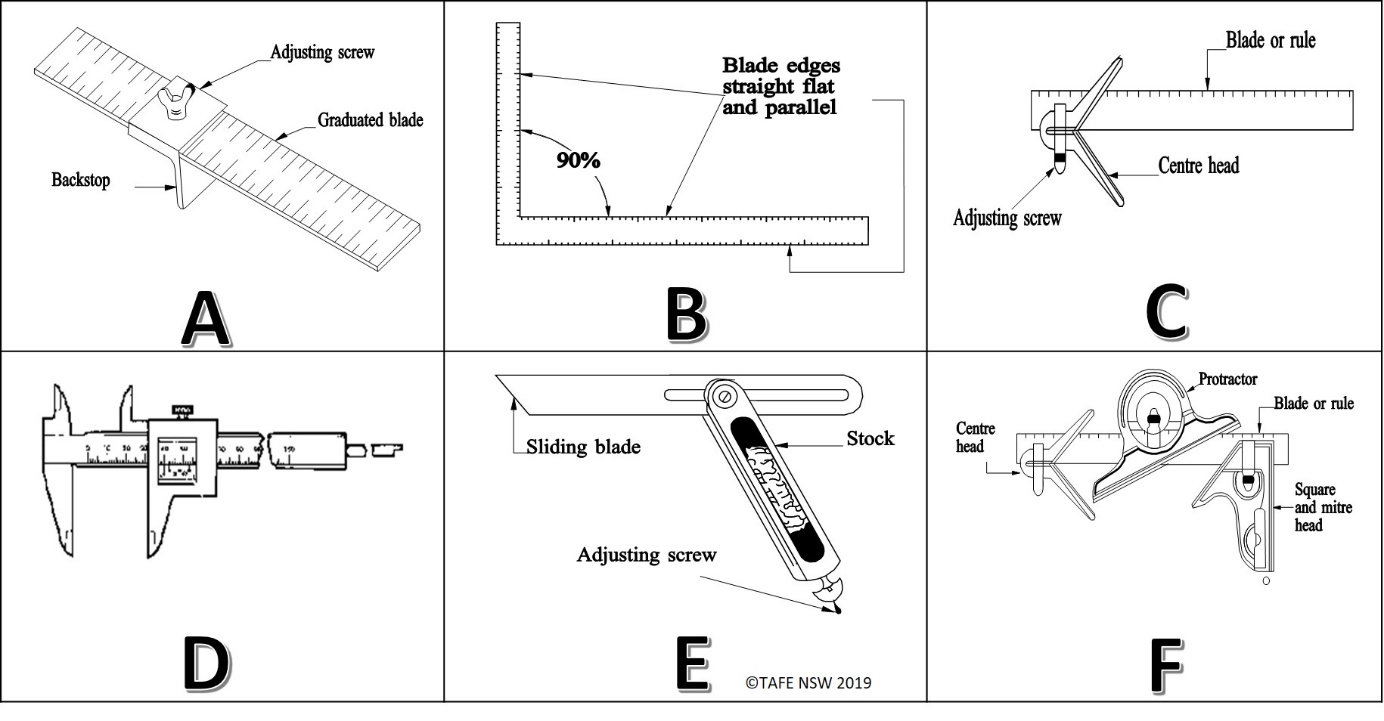
1. (Rk 1) In the table below, name the tool shown with the corresponding letter.

E.g. A = Tape measure.



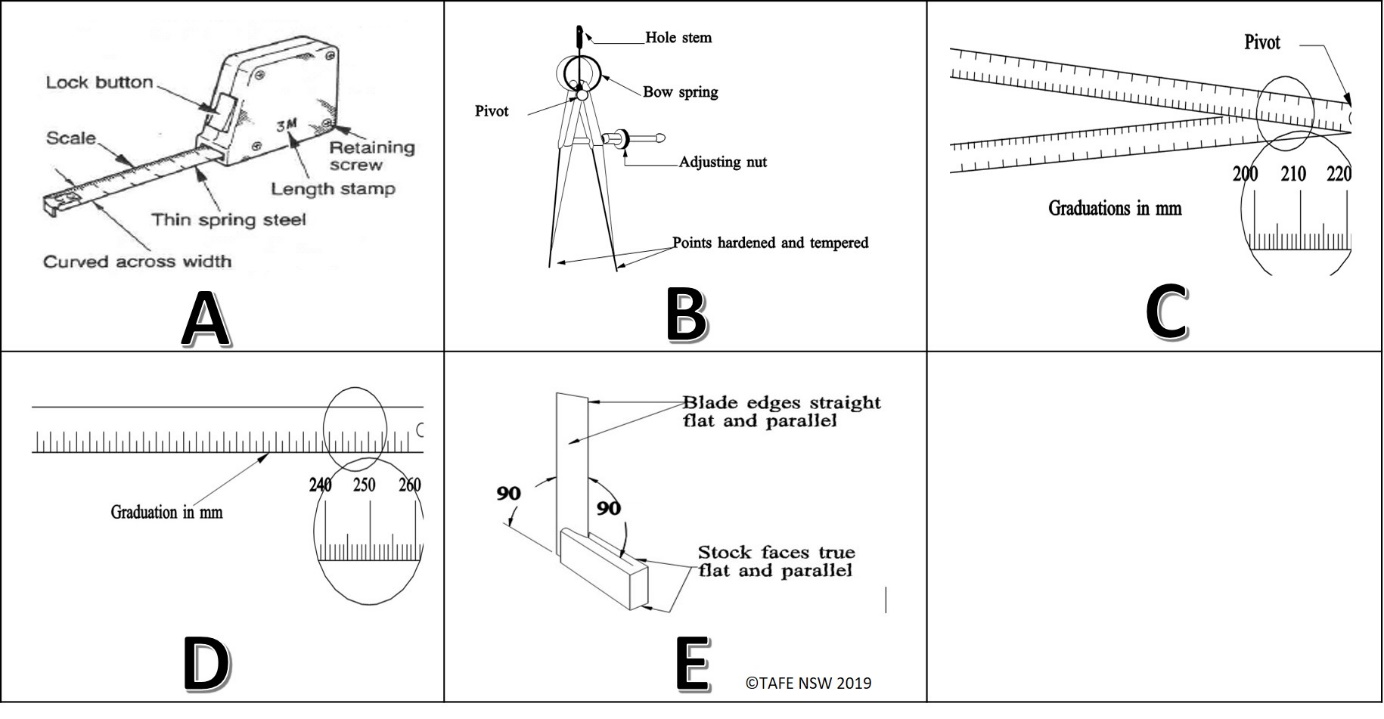
|  |  |
| --- | --- |
| Picture | Tool Name |
| **A** | **Tape measure** |
| B | *Dividers* |
| C | *Folding rule with line of chords* |
| D | *Steel rule* |
| E | *Block square ( Engineers square)* |

1. (Rk 1) In the table below, name the tool shown with the corresponding letter.



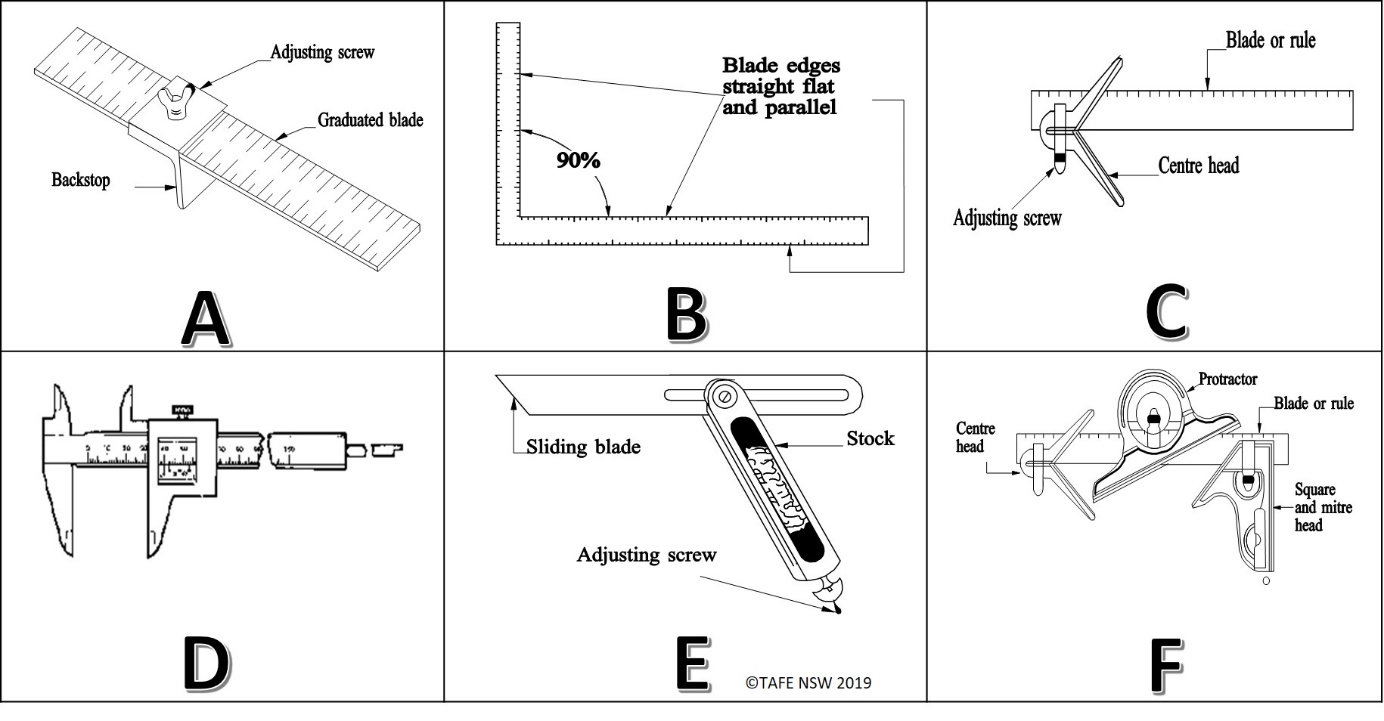
|  |  |
| --- | --- |
| Picture | Name |
| A | *Angle or back gauge* |
| B | *Plate square* |
| C | *Centre square* |
| D | *Vernier callipers* |
| E | *Bevel square/sliding bevel* |
| F | *Combination set* |

1. (Rk 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** – Taking measurements over a long distance



|  |  |
| --- | --- |
| Picture of Measurement tool | Part letter selection from pictures |
| Accurate measurements over the length of the device | *D* |
| Drawing arcs and circles, transferring measurements and angles from one place to another, geometric construction of angle, geometric division of lines, angles | *B* |
| Taking measurements over long distances | A |
| Marking square lines off plate edges or existing lines and rolled steel sections | *E* |
| Accurate measurements over the length of the device and the transfer of angles | *C* |

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

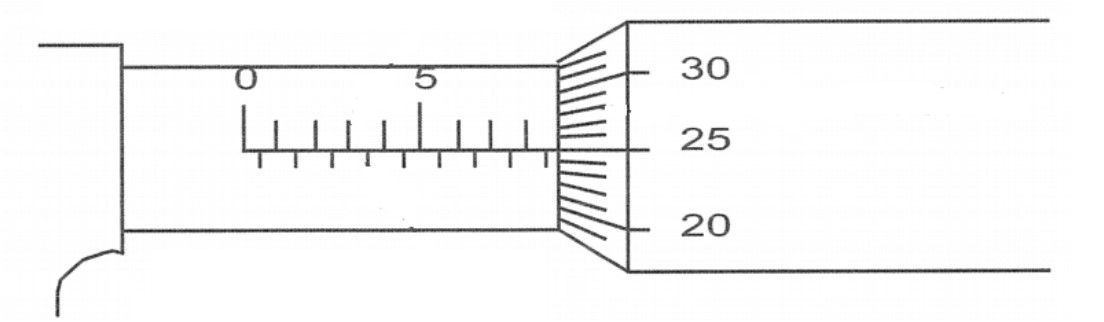


|  |  |
| --- | --- |
| Picture of Measurement tool | Part letter selection from pictures |
| Marking square lines off plate edges or existing lines | *B* |
| Transferring angles | *E* |
| High accuracy measuring instrument for measuring inside, outside and depth dimensions | *D* |
| Locating the centre on circular objects | *C* |
| Marking lines at any angle and to locate the centre of circular objects | *F* |
| Accurately locating gauge lines to position items or hole centres. | *A* |

1. (Rk 2) Complete the table below by writing the correct answer next to the questions.

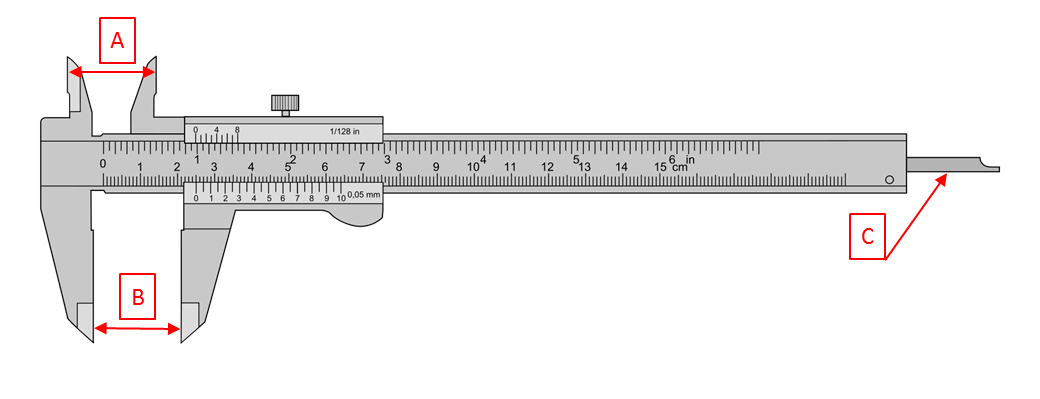
|  |  |
| --- | --- |
| Question | Answer |
| 1. The measurement of length in a straight line from one side of a circle to the other is known as the: | *Diameter* |
| 1. A measurement taken in a straight line is known as: | *Length* |
| 1. How many millimetres (mm) are there in 1 metre? | *1,000* |
| 1. How many meters are there in 1 Kilometre? | *1,000* |
| 1. How many millimetres (mm) are there in one inch (1”)? |  |

1. (Rk 2) The reading on the Micrometre scale as shown in the diagram below is:



***8.75mm***

1. (RK 2) 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 |

1. (Rk 3) Complete the table below by writing the correct answer to the questions in the column on the right

|  |  |
| --- | --- |
| Question | Answer |
| 1. How many millimetres (mm) are there in 10” inches | 10 x 25.4 = 254 mm |
| 1. Convert 3 ¼ “ inches to millimetres (mm) | 3.25 x 25.4 = 82.55 mm |
| 1. Convert 19.75mm to inches ( round off to 2 decimal points) | 19.75 ÷ 25.4 = 0.78 inches |
| 1. 1,239 + 4,367 + 5,874 = | 11,480 |
| 1. 8,329 – 4,367 = | 3962 |
| 1. 127 x 96 = | 12,192 |
| 1. 11,176 ÷ 88 = | 127 |
| 1. Convert 5/8 to a decimal ( round off to 3 decimal places) | 1. ÷ 8 = 0.625 |

1. (RK2) Drawing A and Drawing B below are showing the same joining plate. Using the dimensions given in Drawing A, calculate and record the dimensions for Drawing B in the space provided.

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

1. (Rk 3) Using the drawing of the joining plate in question 9 above calculate the length required to mark out 40 off joining plates from a 6 metre length of flat bar.

***40 x 122(B)*** = 4880 mm

1. (Rk 3) Using the answer from question 9 above what would be the length of offcut left from the 6 metre length of flat bar

*6000mm – 4880 (answer Q 10) =* ***1120mm***

1. (Rk 4) In the table below mark a letter X for three (3) points that are to be considered when storing measuring devices:

|  |  |
| --- | --- |
| Storage consideration points | Put X in box for considerations |
| Store each measuring device in its own case or box to protect it from damage | X |
| Stack all measuring devices together on top of each other in the bottom corner of a toolbox |  |
| Store measuring devices in a dry place away from corrosive chemicals or solvents | X |
| Allocated pockets in tool bags for measuring devices to be stored individually away from heavy tools | X |

1. (Rk 5) In the table below circle in the yes or no box to indicate if each listed measuring tools can be routinely adjusted

|  |  |  |
| --- | --- | --- |
| Measuring tool | Tick correct response Check box | |
| **YES** | **NO** |
| Plate Square |  |  |
| Combination Square |  |  |
| Block Square |  |  |
| Line of Chords |  |  |
| 300mm Rule |  |  |

1. (Rk 7) List four (4) safe practices you must follow when using marking tools.

Possible answers include

1. ***Keep all tools sharp***
2. ***Remove all burrs off the heads of centre punches***
3. ***Do not put scribers in your pockets***
4. ***Do not throw tools on benches***
5. ***Do not skylark in the workplace***
6. ***Wear appropriate PPE in workplace.***
7. (Rk 7) 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 accurately to the finest graduation. |

1. (RK 5) In the space below explain the process for zeroing a Vernier calliper.

|  |
| --- |
| *A vernier caliper is zeroed by cleaning the faces/jaws of the tool that come together to measure diameters or lengths.*  *When the faces are together in the closed positon the reading should be 0.00 mm* |