

# Mathematics assessment criteria

## Criterion A: Knowing and understanding

Maximum: 8

At the end of year 10, students should be able to:

- i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations
- ii. apply the selected mathematics successfully when solving problems
- iii. solve problems correctly in a variety of contexts.

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1–2	The student is able to: <ol style="list-style-type: none"> <li>i. select appropriate mathematics when solving simple problems in familiar situations</li> <li>ii. apply the selected mathematics successfully when solving these problems</li> <li>iii. generally solve these problems correctly in a variety of contexts.</li> </ol>
3–4	The student is able to: <ol style="list-style-type: none"> <li>i. select appropriate mathematics when solving more complex problems in familiar situations</li> <li>ii. apply the selected mathematics successfully when solving these problems</li> <li>iii. generally solve these problems correctly in a variety of contexts.</li> </ol>
5–6	The student is able to: <ol style="list-style-type: none"> <li>i. select appropriate mathematics when solving challenging problems in familiar situations</li> <li>ii. apply the selected mathematics successfully when solving these problems</li> <li>iii. generally solve these problems correctly in a variety of contexts.</li> </ol>
7–8	The student is able to: <ol style="list-style-type: none"> <li>i. select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations</li> <li>ii. apply the selected mathematics successfully when solving these problems</li> <li>iii. generally solve these problems correctly in a variety of contexts.</li> </ol>

## Criterion B: Investigating patterns

Maximum: 8

At the end of year 10, students should be able to:

- i. select and apply mathematical problem-solving techniques to discover complex patterns
- ii. describe patterns as general rules consistent with findings
- iii. prove, or verify and justify, general rules.

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1–2	The student is able to: <ol style="list-style-type: none"> <li>i. apply, with teacher support, mathematical problem-solving techniques to discover simple patterns</li> <li>ii. state predictions consistent with patterns.</li> </ol>
3–4	The student is able to: <ol style="list-style-type: none"> <li>i. apply mathematical problem-solving techniques to discover simple patterns</li> <li>ii. suggest general rules consistent with findings.</li> </ol>
5–6	The student is able to: <ol style="list-style-type: none"> <li>i. select and apply mathematical problem-solving techniques to discover complex patterns</li> <li>ii. describe patterns as general rules consistent with findings</li> <li>iii. verify the validity of these general rules.</li> </ol>
7–8	The student is able to: <ol style="list-style-type: none"> <li>i. select and apply mathematical problem-solving techniques to discover complex patterns</li> <li>ii. describe patterns as general rules consistent with correct findings</li> <li>iii. prove, or verify and justify, these general rules.</li> </ol>

Note: A task that does not allow students to select a problem-solving technique is too guided and should result in students earning a maximum achievement level of 4 in year 10. However, teachers should give enough direction to ensure that all students can begin the investigation.

For year 10, a student who describes a general rule consistent with incorrect findings will be able to achieve a maximum achievement level of 6, provided that the rule is of an equivalent level of complexity.

## Criterion C: Communicating

Maximum: 8

At the end of year 10, students should be able to:

- i. use appropriate mathematical language (notation, symbols and terminology) in both oral and written explanations
- ii. use appropriate forms of mathematical representation to present information
- iii. move between different forms of mathematical representation
- iv. communicate complete, coherent and concise mathematical lines of reasoning
- v. organize information using a logical structure.

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1–2	The student is able to: <ol style="list-style-type: none"> <li>i. use limited mathematical language</li> <li>ii. use limited forms of mathematical representation to present information</li> <li>iii. communicate through lines of reasoning that are difficult to interpret.</li> </ol>
3–4	The student is able to: <ol style="list-style-type: none"> <li>i. use some appropriate mathematical language</li> <li>ii. use appropriate forms of mathematical representation to present information adequately</li> <li>iii. communicate through lines of reasoning that are complete</li> <li>iv. adequately organize information using a logical structure.</li> </ol>
5–6	The student is able to: <ol style="list-style-type: none"> <li>i. usually use appropriate mathematical language</li> <li>ii. usually use appropriate forms of mathematical representation to present information correctly</li> <li>iii. usually move between different forms of mathematical representation</li> <li>iv. communicate through lines of reasoning that are complete and coherent</li> <li>v. present work that is usually organized using a logical structure.</li> </ol>
7–8	The student is able to: <ol style="list-style-type: none"> <li>i. consistently use appropriate mathematical language</li> <li>ii. use appropriate forms of mathematical representation to consistently present information correctly</li> <li>iii. move effectively between different forms of mathematical representation</li> <li>iv. communicate through lines of reasoning that are complete, coherent and concise</li> <li>v. present work that is consistently organized using a logical structure.</li> </ol>

## Criterion D: Applying mathematics in real-life contexts

Maximum: 8

At the end of year 10, students should be able to:

- i. identify relevant elements of authentic real-life situations
- ii. select appropriate mathematical strategies when solving authentic real-life situations
- iii. apply the selected mathematical strategies successfully to reach a solution
- iv. justify the degree of accuracy of a solution
- v. justify whether a solution makes sense in the context of the authentic real-life situation.

Achievement level	Level descriptor
0	The student does not reach a standard described by any of the descriptors below.
1–2	The student is able to: <ol style="list-style-type: none"> <li>i. identify some of the elements of the authentic real-life situation</li> <li>ii. apply mathematical strategies to find a solution to the authentic real-life situation, with limited success.</li> </ol>
3–4	The student is able to: <ol style="list-style-type: none"> <li>i. identify the relevant elements of the authentic real-life situation</li> <li>ii. select, with some success, adequate mathematical strategies to model the authentic real-life situation</li> <li>iii. apply mathematical strategies to reach a solution to the authentic real-life situation</li> <li>iv. discuss whether the solution makes sense in the context of the authentic real-life situation.</li> </ol>
5–6	The student is able to: <ol style="list-style-type: none"> <li>i. identify the relevant elements of the authentic real-life situation</li> <li>ii. select adequate mathematical strategies to model the authentic real-life situation</li> <li>iii. apply the selected mathematical strategies to reach a valid solution to the authentic real-life situation</li> <li>iv. explain the degree of accuracy of the solution</li> <li>v. explain whether the solution makes sense in the context of the authentic real-life situation.</li> </ol>
7–8	The student is able to: <ol style="list-style-type: none"> <li>i. identify the relevant elements of the authentic real-life situation</li> <li>ii. select appropriate mathematical strategies to model the authentic real-life situation</li> <li>iii. apply the selected mathematical strategies to reach a correct solution to the authentic real-life situation</li> <li>iv. justify the degree of accuracy of the solution</li> <li>v. justify whether the solution makes sense in the context of the authentic real-life situation.</li> </ol>