Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Mark: /24

Year 12 Essential 2021Practical Application 1 (Pool Design) marking rubric

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| --- | --- | --- | --- | --- |
|  | A 4 marks | B 3 marks | C 2 marks | D 1 mark |
| Interpret the task and gather the key information | Identifies relevant information from multiple sources or within concentrated sources.  *Evidence in introduction of the following:*   * *Complete perimeter calculations included* * *Complete area calculations included* * *Complete volume calculations included* * *Percentage of land accurately calculated* * *Complete costings considered* * *Sketch included (must be ruled, include a heading and be referred to within report)* * *Complicated shape eg circular pool, spa spillover etc.* | Identifies and links more than one piece of information.  *Evidence in introduction of the following:*   * *Statement that identifies at least 4 of the A grade points* * *Sketch included with some missing information* * *More complicated than a rectangle, composite shape, e.g. spa on the side, shallow end / deep end.* | Identifies relevant information and chooses the appropriate mathematics to solve a problem in straightforward or familiar situations.  *Evidence in introduction of the following:*   * *Statement that identifies at least 3 of the A grade points* * *Sketch included*   *Basic Rectangle* | Identifies some relevant information in straightforward or familiar situations.   * *Restates problem* * *No sketch provided* |
| identify the mathematics which could help to complete the task | Chooses the appropriate mathematical techniques to solve a range of problems in unstructured situations.   * *Demonstrates a systematic approach to incorporating a changed or unique condition e.g. standard building measurements, inclusion of gate, a range of costings* | Chooses the appropriate mathematical and techniques to solve problems in mostly familiar and sometimes unstructured situations.   * *Incorporates some changed conditions that need to be included/modified e.g. researching standard heights, inclusion of gate* | Plans the solution of real problems in Practical applications when an overview of the mathematical thinking process has been provided.   * *Does not take into account changed conditions* . | Sometimes chooses the appropriate mathematics to solve a problem in straightforward or familiar situations. |
|  | A 4 marks | B 3 marks | C 2 marks | D 1 mark |
| analyse information and data from a variety of sources | Incorporates information from multiple sources and demonstrates a systematic approach to accurately solve multi-step problems, including those from unfamiliar situations.   * *References (all aspects of design sourced)* * Step-wise calculations that is clear for reader to follow (use of sub headings) * Details of brands/type of materials included | Applies information and calculates mostly accurate solutions for multi-step problems.   * *Most aspects of designed referenced* * *Step-wise calculations that are mostly accurate and mostly clear to follow* * *Most of the materials selected have details/brand noted in report* | Applies information and calculates mostly accurate solutions for problems in familiar situations involving one or more steps.   * *Some aspects of designed referenced* * *Calculations included but are unclear or steps missing* * *Some of the materials selected have details/brand noted in report* | Applies information and calculates some accurate solutions for routine and practised problems with one or more steps.   * *No sources accessed* * Limited calculations that are unclear |
|  | A 8 marks | B 6 marks | C 4 marks | D 2 marks |
| apply existing mathematical knowledge and strategies to obtain a solution. | Modifies calculated results or conclusions when conditions are changed.   * *Correct area of pool considered and calculations shown* * *Correct perimeter, area and volume calculations applied to accurately calculate different aspects of the pool design (more complicated area calculations for more complicated shapes gives higher marks)* * *Applies area calculations to accurately calculate amount/cost of tiles needed* * *Complete costings contained in report in a step wise manner* * *Calculates multiple other costs, e.g. decking, feature stones, outdoor shower, running costs, chemicals, pumps etc* | Applies appropriate graphing techniques and determines appropriate scales based on the data.  Incorporates some changed conditions when solving problems in familiar situations.   * Correct area of pool considered * Minimal errors in *perimeter, area and volume calculations of different aspects of the pool design* * *Begins to apply area calculations to accurately calculate amount/cost of tiles needed* * *Most costings contained in report in a step wise manner* * Calculates other costs for backyard eg decking | Applies appropriate graphing techniques.  Rounds to an appropriate level for everyday contexts.   * Correct area of pool considered * Errors or gaps in *perimeter, area and volume calculations of different aspects of the pool design* * *Errors in area calculations to accurately calculate amount/cost of tiles needed* * *Uses estimations techniques to calculate costings or material amounts* | Uses appropriate graphing techniques with support.   * Errors or limited *perimeter, area and volume calculations of different aspects of the pool design* * *Does not accurately calculate amount/cost of tiles needed* * *Disjointed estimations techniques to calculate costings or material amounts* |
|  | A 4 marks | B 3 marks | C 2 marks | D 1 mark |
| verify the reasonableness of the solution | Verifies the reasonableness of solutions and adjusts when necessary.   * *Calculations referred to/summarised within report* * *Report contains a detailed reflection on what part of the Mathematical Thinking Process could be improved if this task were to be replicated* | Checks calculated results and adjusts where necessary.   * *Calculations referred to/summarised within report* * *Report contains a reflection on what part of the Mathematical Thinking Process could be improved if this task were to be replicated* | Seldom checks results in the light of the original problem.   * *Calculations referred to/summarised within report*   *OR*   * *Report contains a reflection on what part of the Mathematical Thinking Process could be improved if this task were to be replicated* | Rarely, checks results. |
|  | A 4 marks | B 3 marks | C 2 marks | D 1 mark |
| communicate findings in a systematic and concise manner. | Uses accurate mathematical language and expressions to communicate methods and solutions to multi-step problems.  Accesses a comprehensive range of mathematical concepts to validate conclusions which are related to the original question or context.   * *Concise, systematic Mathematical Thinking Process layout* | Accesses a range of mathematical concepts to communicate solutions and justify conclusions which relate to the original question or context, including for some non-routine problems.   * *Clear, systematic Mathematical Thinking Process layout* | Shows working, including intermediate steps and/or expressions entered into a calculator or spreadsheet.  Provides short statements based on straightforward observations which are related to the original question or context.   * *Has concluded findings* * *Neat/Clear structure* | Shows limited working, including some intermediate steps and/or expressions entered into a calculator or spreadsheet.  Provides short statements which may not be related to the original question or context.   * *Findings lack a clear structure* |