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| pact jpg1 | **Year 11 Mathematics: Applications**  **Investigation 4, 2015**  **Topic – Piecewise Linear Graphs**  **Inclass component** | | | | **\_\_\_\_\_\_ / 55**    **\_\_\_\_\_\_ %** |
| **Important Information:**  *Although the take-home component is not worth any marks, it is essential in preparation for the in-class component. Knowledge and skills gained will be extended in the in-class validation component. This in-class validation will be completed under test conditions on the day in which this take-home component is due. The take-home component may be used when completing the in-class component. Contact may be made to parent(s) if the take-home component is not available for submission (at the start of the lesson).* | | | | | |
| **Date out:** | | *Week \_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_* | **Date Due:** | *Week \_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_* | |
| **Take home component weighting:** | | *0% of the year* | **In-class component weighting:** | *10% of the semester* | |
| **AIM:** *In this assessment, you will be investigating how to sketch piece-wise linear graphs, using technology when appropriate and the applications of this process.* | | | | | |

**Tax Rates 2010/2011 Financial Year**

|  |  |
| --- | --- |
| **Taxable income** | **Tax on this income** |
| 0 – $6,000 | Nil |
| $6,001 – $37,000 | 15c for each $1 over $6,000 |
| $37,001 – $80,000 | $4,650 plus 30c for each $1 over $37,000 |
| $80,001 – $180,000 | $17,550 plus 37c for each $1 over $80,000 |
| $180,001 and over | $54,550 plus 45c for each $1 over $180,000 |

Medicare Levy = 1.5%

Medicare Levy Surcharge = 1%

**(29 marks: 1 mark each entry)**

Task 1] Use **only** the tax table above to complete the following tables of values.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Income | 6001 | 12000 | 18000 | 24000 | 36000 | 37000 |
| Tax Payable in $ |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Income | 37 001 | 40 000 | 45 000 | 50 000 | 55 000 | 60 000 | 65 000 | 70 000 | 75 000 | 80 000 |
| Tax Payable in $ |  |  |  |  |  |  |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Income | 80 001 | 90 000 | 100 000 | 120 000 | 130 000 | 140 000 | 150 000 | 160 000 | 170 000 | 180 000 |
| Tax Payable in $ |  |  |  |  |  |  |  |  |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Income | 180 001 | 190 000 | 200 000 |
| Tax Payable in $ |  |  |  |

**(10 marks)**

**Task 2]** Construct a piecewise **line graph** to represent the information contained within the tables of values in task 1, using “Tax Payable” as the y axis $2000 increments and “Taxable Income” in $10 000 increments as the x axis. (**HINT**: The x axis should go from 0 at the origin to at least 22 with each square representing $5000 to allow for all of the coordinates and the y axis from 0 at the origin to 60 with each line representing $2000.)

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Use the previous graph to answer the following questions;

**(10 marks)**

**Task 3]**

Produce a piecewise Linear Function F(x) using the first tax bracket then the four tables of values and define F(x) by filling in the missing information in the following;

**F(x) = 0 if 0 < 0.6001**

**if 0.6001 < x < 3.7001**

**if \_\_\_\_\_< x < \_\_\_\_\_**

**if \_\_\_\_\_< x < \_\_\_\_\_**

**if \_\_\_\_\_< x < \_\_\_\_\_**

**(6 marks)**

**Task 3]** Compare the piecewise function F(x) in the take home investigation to the piecewise function F(x) above. If Daniel’s taxable income in 2010 was $48 000 how much tax would he pay then and given he has not had a pay rise since then, what is the difference in tax payable then to what it was in 2015?

**~** End of Investigation**~**