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| Description: S:\AdminShared\All Staff\1 College Logo's\Baldivis_Logo_colour.jpg | **Year 11 Mathematics: Applications**  **Investigation 4, 2017**  **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 $ |  |  |  |  |  |  |

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

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 4]**

Daniel’s taxable income in 2010 was $48 000. Using your function F(x) calculate how much tax does Daniel need to pay?

Given that the Medicare levy is1.5% and Medicare levy surcharge is 1% of your taxable income and that it is added to your tax payable, what would be the total payable tax for Daniel on his income of $48 000?

If Daniel’s taxable income in 2010 was $48 000 given he has not had a pay rise since then, what is the difference in total tax payable then to what it was in 2015?

Compare the piecewise function F(x) in the take home investigation to the piecewise function F(x) above. Which function produces greater tax and why?

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